From: Garman, Kate
To: Brinson, Leslie; Roskin, Miriam; Zimbabwe, Sam; Helmbrecht, Elliot; Adkins, Genesee; Garfinkel, Martin; Levitas, Kerem; Prentice, Mark; Blair, Kyla; Auriemma, Anthony
Cc: Thompson, Adrienne; Rolf, Kylie
Subject: AHR Final Mayoral Briefing -- LAST CALL FOR EDITS
Date: Wednesday, April 24, 2019 11:06:55 AM
Attachments: AHR Final Mayoral Briefing.pptx

All-
Thank you thank you thank you for getting everything to me. This is the complete presentation for today. SPEAK NOW OR FOREVER HOLD YOU PEACE BY 1:30 WHEN THIS THING GOES TO PRINT.
I'll have multiple copies printed out, just bring yourself during your time. Thanks!!
Kate

Affordable Housing Revenue

April 24, 2019

Agenda

▪ Tax Structure [Kate]	10 minutes
▪ TOD Housing Spend Plan [Leslie + Miriam]	10 minutes
▪ Transit and Mobility Spend Plan [Sam & Elliot]	10 minutes
▪ Work Protections & Outreach [Marty & Kerem]	20 Minutes
▪ Comms/Outreach/Council [Mark + Kyla +Anthony]	35 Minutes
▪ Next Steps [Kylie]	Conclusion

Proposal: Goals

[redacted]

Proposal: Specifics

[redacted]

Revenue Projections

[redacted]

Spending Allocation

- First Four Years

[redacted]

- Remaining Years

[redacted]

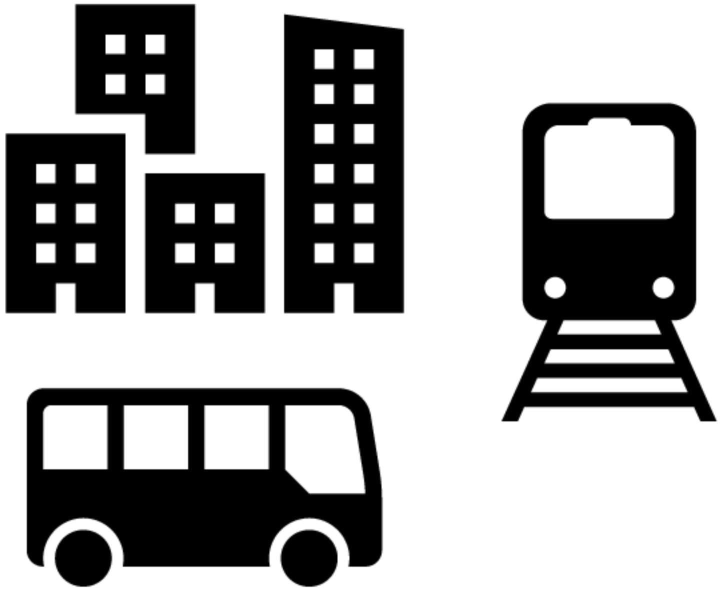
Revenue Allocation

[redacted]

[redacted]

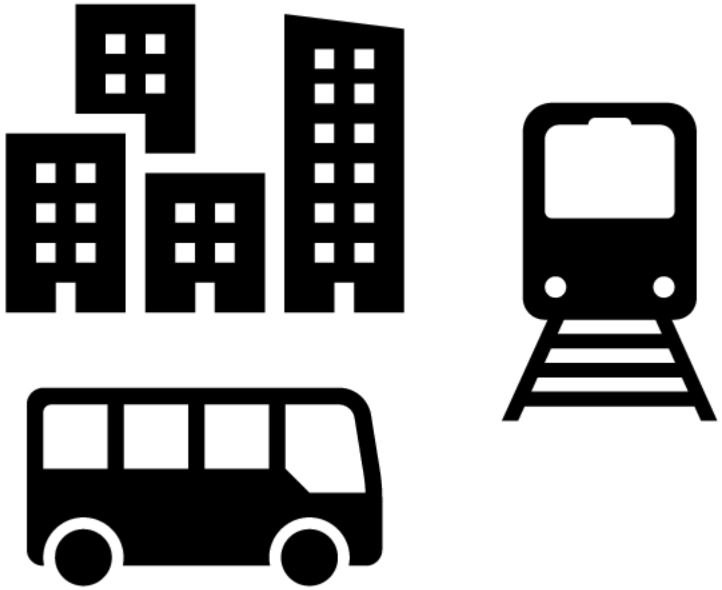
Transit-Oriented Affordable Housing

[redacted]



[redacted]

Decision Points on Housing Spend Plan



[redacted]

Transit & Mobility: Overview

STRENGHTENING OUR MULTIMODAL NETWORK

MITIGATING THE IMPACTS OF TNCS

Strengthening Our Multimodal Network

[redacted]

Mitigating the Impacts of TNCs

[redacted]

[redacted]

Work Protections: Key Decisions

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Week of April 29

- Outreach: Identify key stakeholders to form steering committee and begin initial outreach of scheduling meetings.
- Council: Meet with prospective Council champions – O'Brien, Mosqueda, Harrell – to inform them of general thinking about legislation and plans. Solicit initial feedback.
- Communications: Message and materials development under the following frames: transportation, congestion, housing, climate and livability.

Week of May 6

- Outreach: Key stakeholder outreach with JAD and staff to "steering committee" members.

- Council: Continue discussions with Council champions to secure support, brief Central Staff analysts, collaboratively determine committee schedule.

- Communications: Message and materials development.

Week of May 13

- Outreach: Stakeholder engagement expands with 1-2 meetings that include JAD/Shefali, key stakeholders, and Council champions and additional stakeholders

- Council: Include Council champions in stakeholder engagement meetings. Schedule briefings for remaining Councilmembers.

- Communications: Develop full suite of materials in anticipation of May 27^{th} rollout.

Week of May 20

- <u>Outreach</u>: Continue stakeholder outreach through JAD, Shefali and steering committee – continue to identify and produce validators.
- <u>Council</u>: Begin briefing remaining Councilmembers. Connect validators with Council champions and other CMs.
- <u>Communications</u>: Finalize full suite of materials.

May 27th (Launch Week!!)

- Outreach: Prep validators with messaging toolkits, launch event and to be public speakers in support of this legislation.

- Council: Finish briefing all Councilmembers prior to public announcement. Include Council champions in launch event.

- Communications: Public rollout, including: Media pre-briefs, toolkits for allies and validators, launch event, one-on-one interviews.

June - August Council Process

******During this period - Continued proactive communications, outreach and activation of validators***

- <u>June 10</u> – Bill Transmitted to Council
- <u>June-July</u> – Committee Discussions begin (2-3 mtgs per committee)
  - O'Brien Transportation Committee: Congestion Tax ORD
  - Mosqueda Workers' Rights Committee: Driver Rights ORD
- <u>Early August</u> – Potential Committee Votes
  - August 1: Driver Rights ORD
  - August 6: Congestion Tax ORD
- <u>August 12</u> – Full Council Vote

September Council Process + Other Factors

- September
  - If committee consideration stretches past August recess, both committees meet twice in September as back-up dates
  - September 23: Last Full Council vote prior to Budget Season

- Other Factors

From: Adkins, Genesee
To: Zimbabwe, Sam; Helmbrecht, Elliot
Subject: AHR Materials for 2:00
Date: Thursday, April 18, 2019 1:55:45 PM
Attachments: BMP_Tables.pdf
CorridorProjectDeliveryTimelineDocument_0418_2019_Updated.pptx
Theory XYZ spending plan 041819.xlsx
Transit Plus Multimodal Corridors_funding scenario 041719.docx
image001.png
image002.png

Sam, Elliot,

I'm bringing 20 each of these for the 2:00 briefing. Perhaps you won't want to hand out any of these, and the memo alone will cover the bases for today, but we have these ready in case they're helpful.

Thanks and break a leg,

Genesee

Genesee C. Adkins
Chief of Staff
City of Seattle Department of Transportation
O: 206-615-1963 | M: 206-492-3395 | genesee.adkins@seattle.gov

PROJECTS FUNDED THROUGH CONSTRUCTION WITH LOW RISKS									
Project Number	**Project Name**	**Type**	**Length (miles)**	**Target year**	**BMP Project Status**	**2019-2024 BMP Spending Projection**	**Risk**	**Outreach Status**	**Outreach Start Date**
1	AAC - S Columbian Way/S Alaska St (2018 AAC Package)	PBL	1.11	2019	Construction	$790,000	Low Risk	Construction outreach, on-the-ground Issue with parking across PBL in gravel shoulder	August 2016
2	AAC - S Dearborn St	PBL	0.46	2019	Construction	$200,000	Low Risk	Done	August 2016
3	AAC - Swift/Myrtle/ Othello (2018 AAC Package)	PBL	1.75	2019	Construction	$243,000	Low Risk	Construction outreach, on-the-ground Some parking removal	August 2016
4	AAC - Wilson Ave S (2018 AAC Package)	PBL	0.81	2019	Construction	$264,000	Low Risk	Construction outreach, on-the-ground Removes one side of parking; organize neighborhood opposition to parking removal Advocates support project	August 2016
Spot	Aurora and 83rd signal (2019 AAC Package)	Other	0 (spot)	2019	Design	$600,000	Low Risk, requires WSDOT Coordination	Spoken with all surrounding properties about outdated intersection design and safety improvements coming after injuries/fatality	
5	MMC - Union PBL	PBL	0.67	2019	Planning	$400,000	Low Risk	In progress	March 2015 (In coordination with the Madison MM project)
6*	NE 70th St PBL	PBL	0.10	2019	Construction	$100,000	Low Risk, requires WSDOT Coordination	Construction outreach, on-the-ground Removes parking from both sides of street for three blocks Community-requested project through the Neighborhood Street Fund process	February 2018
6*	NE 70th St Connection to PBL	NGW	0.17	2019	Construction	$-	Low Risk, connects to WSDOT Coordinated PBL	Construction outreach, on-the-ground Removes parking from one side of street Community-requested project through the Neighborhood Street Fund process	
7	North Seattle NGW	NGW	2.70	2019	Construction	$870,000	Low Risk	Construction outreach, on-the-ground; almost done Add two traffic diverters, which have mixed feedback about circulation	July 2016
8	SRTS (High Point Loop)	NGW	0.88	2019	Construction	$250,000	Low Risk	Construction outreach, on-the-ground No major issues	Nov 2016
9	VZ - NE 65th St Vision Zero Safety Corridor	PBL	0.74	2019	Construction	$1,150,000	Low Risk	In progress (almost done)	February 2017

PROJECTS FUNDED THROUGH CONSTRUCTION WITH LOW RISKS									
Project Number	Project Name	Type	Length (miles)	Target year	BMP Project Status	2019-2024 BMP Spending Projection	Risk	Outreach Status	Outreach Start Date
10	West Seattle Phase 1	NGW	2.21	2019	Construction	$500,000	Low Risk	Construction outreach, on-the-ground No major issues	Nov 2016
11	12th Ave S PBL- Golf Dr to S King St	PBL	0.25	2020	Planning	$350,000	Low Risk, requires Load Zone & Transit Access Coordination	In Progress; working with community on load zones and transit access	October 2018
12	AAC - Green Lake Park Loop (2019 AAC Package)	PBL	2.55	2020	Design	$4,400,000	Low Risk, requires Right of Way acquisition, requires coordination with Parks.	Pre-construction outreach, on-the-ground Major paving on busy arterials Interagency coordination with Parks Adds PBLs around most of the lake, reconfigures intersections, changes parking in some areas Two years of outreach, meetings, mailings, briefings	April 2017
13	AAC - N 50th St (2019 AAC Package)	BL	0.27	2020	Design	$360,000	Low Risk	Part of Green Lake paving outreach above, but no major rechannelization	April 2017
Spot	AAC - N 80th St (2019 AAC Package)-Green Lake PBL	Other	0 (spot)	2020	Design	$370,000	Low Risk	Part of Green Lake paving outreach above, but no major rechannelization	April 2017
14	AAC - SW Avalon Way and 35th Ave SW (2019 AAC Package)	PBL	0.90	2020	Design	$1,300,000	Low Risk, requires Load Zone & Transit Access Coordination	Pre-construction outreach, on-the-ground Major paving on busy arterials Adds PBLs and removes some parking and all center turn lane Focus of CM Herbold Opposed by business/property owner because of parking removal Covered closely by West Seattle Blog Two years of outreach, meetings, mailings, briefings	April 2017
15	Center City - 9th Ave N	PBL	0.24	2020	Planning	$300,000	Low Risk, requires Private Development Coordination	Design outreach done with Parks Starting outreach with SLU Saturday market and properties this spring	Since 2016
16	Green Lake to Interurban Connection	NGW	0.38	2020	Planning	$100,000	Low Risk	Neighborhood stakeholders requesting earlier implementation; project outreach not yet started	
17	Judkins Park Connection	NGW	0.26	2020	Design	$70,000	Low Risk	Ongoing outreach	August 2016

PROJECTS FUNDED THROUGH CONSTRUCTION WITH LOW RISKS									
Project Number	**Project Name**	**Type**	**Length (miles)**	**Target year**	**BMP Project Status**	**2019-2024 BMP Spending Projection**	**Risk**	**Outreach Status**	**Outreach Start Date**
18*	Melrose Promenade (NGW segment)	NGW	0.83	2020	Planning	$2,600,000	Low Risk	Ongoing outreach, but few interactions because it's pavement repair, speed humps, and sharrows	February 2018
18*	Melrose Promenade (PBL segment)	PBL	0.10	2020	Planning	$600,000	Low Risk, potential for minor parking and loading impacts	Concept planning done Focused conversations with property owners in Pike-Pine block to widen sidewalk, which we're doing Currently doing outreach for new PBLs and parking removal in Olive-Denny blocks Meeting some opposition to load zone relocations and parking removal from condo/apartments	February 2018
19	N 34th St Mobility Improvements	PBL	0.33	2020	Planning	$1,600,000	Low Risk	Concept and planning outreach done Advocates' preferred alternative of two-way PBL not moving forward; pair of PBLs instead No major opposition Continue to have community and property conversations about design at each milestone	Fall 2017
20	NGW Connection to Missing Link 1	NGW	0.35	2020	Design	$90,000	Low Risk, Dependent upon Missing Link project	Not yet started	
21	NGW Connection to Missing Link 2	NGW	0.05	2020	Design	$20,000	Low Risk, Dependent upon Missing Link project	Not yet started	
22	S Lander Street Bridge	Trail	0.24	2020	Design	$-	Low Risk	Major construction of new bridge Construction outreach, on the ground Continued frustration in advocate community that new bridge includes one sidewalk not two	
23	SRTS (Highland Park Connection Ph 1)	NGW	1.45	2020	Pre Planning	$340,000	Low Risk	Not yet started	
24	SRTS (Lowell - Meany Connection)	NGW	0.79	2020	Design	$190,000	Low Risk	Continued conversations with community about which streets and intersections make best routes for schools and kids Doing outreach about intersection changes ahead of construction	

PROJECTS FUNDED THROUGH CONSTRUCTION WITH LOW RISKS									
Project Number	**Project Name**	**Type**	**Length (miles)**	**Target year**	**BMP Project Status**	**2019-2024 BMP Spending Projection**	**Risk**	**Outreach Status**	**Outreach Start Date**
25	SRTS (Viewlands Connection)	NGW	1.09	2020	Pre Planning	$260,000	Low Risk	Not yet started	
26	SRTS (Wing Luke Elementary Connection)	NGW	0.80	2020	Design	$300,000	Low Risk	Not yet started	
27	West Seattle Phase 2a	NGW	0.17	2020	Design	$1,000,000	Low Risk	Ongoing outreach; new signal with turn restrictions will address collision location and improve mobility	Nov 2016
28	Northgate to Maple Leaf Light Rail Connection	NGW	1.13	2021	Design	$480,000	Low Risk	Ongoing outreach; route selected to connect people to Northgate light rail for 2021 opening	March 2017
29	Northgate to Pinehurst Light Rail Connection	NGW	1.12	2021	Design	$470,000	Low Risk	Ongoing outreach; route selected to connect people to Northgate light rail for 2021 opening	March 2017
30	SRTS (Ingraham HS Connection Ph 1)	NGW	1.25	2021	Planning	$800,000	Low Risk	Initial outreach has begun in conjunction with N 130th Station Access planning	March 2019
31	West Seattle - 35th Ave SW Alternative - Camp Long Connection	NGW	0.72	2021	Design	$177,000	Low Risk, Dependent upon VZ signal project	Not yet started	
32	West Seattle Phase 2b	NGW	1.21	2020	Design	$1,300,000	Low Risk	Ongoing outreach; route selected by community to connect with West Seattle Junction	Nov 2016
33	SRTS (Hazel Wolf K-8) Pinehurst Connection	NGW	0.89	2022	Pre Planning	$220,000	Low Risk, Dependent upon SRTS/PMP signal project	Not yet started	
34*	4th Segment 1 (Pine to Spring)	PBL	0.36	2020	Design	$500,000	Low Risk, potential for parking and loading impacts	Parking impacts, coordination with Hotel Monaco about load zones.	2015'
35*	Central Ridge Phase 1	NGW	0.75	2020	Design	$480,000	Low Risk, Previous commitment	Ongoing outreach; route selected through community process; improvements coordinated with private development SIP	March 2017
	7th Ave	PBL	0.20	2020			Low Risk, construction by Amazon	In progress	2017
	Battery St	BL	0.20	2020			Low Risk, construction by WSDOT		
	Grand Totals		**30.49**			**$24,044,000**			

PROJECTS FUNDED THROUGH CONSTRUCTION WITH RISKS									
Project Number	Project Name	Type	Length (miles)	Target year	BMP Project Status	2019-2024 BMP Spending Projection	Risk	Outreach Status	Outreach Start Date
34*	Center City - 4th Ave (segment 2 Vine to Pine)	PBL	0.61	2021	Design	$1,100,000	Funding and Depending on design, level of service impacts, paving impacts	Outreach large downtown stakeholders includes: Safeco Plaza, Unico/U of W, Macy's Building, Westlake Center, Securities Parking Garage, Dahlia Lounge, Shelby apartments, Security House Building and others.	2015
34*	Center City - 4th Ave (segment 3 Spring to Main)	PBL	0.53	2021	Design	$1,100,000	Funding and Depending on design, level of service impacts, paving impacts	Same as above	2015
36*	Center City - 8th Ave -Interim	PBL	0.55	2019	Planning	$600,000	Potential for parking and loading impacts	Concept of 7th/8th PBL couplet shared for years This year started high level property owner and downtown resident/business group outreach In Spring will meet with all property owners/managers about PBL design specifics No organized opposition to concept at this time Will work through parking and lane shifts with each property and learn more	2015
37*	Center City - Pike/Pine Interim	PBL	0.60	2019	Planning	$800,000	Potential for parking and loading impacts	Concept of Pike/Pine PBLs shared for years Community and advocate priority Last year started high level property owner and downtown resident/business group outreach Advocates/community did own outreach in fall 2018 In Spring will meet with all property owners/managers about PBL design There will be parking removal from at least half of Pike St on Capitol Hill Will work through parking and lane shifts with each property and learn more	2015
38	King Street - 2019/2020 Delivery	NGW	1.05	2019	Design	$2,500,000	Private development to construct part	Years of concept and design outreach are done Doing pre-construction outreach in close contact with CID stakeholders	Aug 2016
39	Burke Gilman Trail - Missing Link	Trail	1.42	2020	Design	$200,000	Legal challenges	Organized opposition to project Organize support of project Working through legal issues	Current Iteration - 2013

PROJECTS FUNDED THROUGH CONSTRUCTION WITH RISKS									
Project Number	Project Name	Type	Length (miles)	Target year	BMP Project Status	2019-2024 BMP Spending Projection	Risk	Outreach Status	Outreach Start Date
40*	Key Arena - NODO - Queen Anne/1st	PBL	0.47	2020	Pre Planning	$-	Private Developer to design and construct	Concept of PBL couplet from advocates and reflected in North Downtown Mobility Plan	October 2018
40*	Key Arena - NODO - 1st/ Broad st	PBL	0.25	2020	Pre Planning	$-	Partnership-dependent		October 2018
Spot	King Street - 12th & King	NGW	0 (spot)	2020	Design	$630,000	Design to coordinate with adjacent projects	Years of concept and design outreach are done Intersection construction delayed 1 year for coordination with 12th Ave S project; Interim project to be installed in 2019	Aug 2016
Spot	King Street - Under I-5	NGW	0 (spot)	2020	Design	$1,180,000	Funding risk	Scope is result of extensive community outreach on the need for improved pedestrian lighting to connect people walking under I-5	Aug 2016
41	Rainier Valley N-S Phase 2	NGW	0.67	2020	Design	$160,000	Requires trail lease agreement WSDOT	Ongoing outreach	Nov 2014
42	SRTS (Lincoln HS Connection)	NGW	0.35	2020	Planning	$1,060,000	Potential for parking and loading impacts	Outreach to be coordinated with Stone Way Paving; NGW outreach not yet begun	
43	VZ -Wedgwood to Roosevelt Connection	NGW	1.39	2020	Design	$430,000	Coordinate with 15th AAC	Project has been introduced to community through NE 65th St Vision Zero project; future NGW specific outreach will focus on construction	
36*	Center City - 8th Ave	PBL	Mileage will match interim design	2021	Planning	$6,000,000	SDOT contractually obligated by Washington state convention center on funding amounts	CCBN paint-and-post outreach happening now Long-term, permanent facility is mentioned by the CCBN project team New outreach will be done when permanent facility gets closer to construction	WSCC Community Benefits Package - 2017
37*	Center City - Pike/Pine	PBL	Mileage will match interim design	2021	Planning	$10,000,000	SDOT contractually obligated by Washington state convention center on funding amounts	CCBN paint-and-post outreach happening now Long-term, permanent facility is mentioned by the CCBN project team New outreach will be done when permanent facility gets closer to construction Would work closely with outreach for Pike Pine Renaissance project funded by Waterfront	WSCC Community Benefits Package - 2017

PROJECTS FUNDED THROUGH CONSTRUCTION WITH RISKS									
Project Number	**Project Name**	**Type**	**Length (miles)**	**Target year**	**BMP Project Status**	**2019-2024 BMP Spending Projection**	**Risk**	**Outreach Status**	**Outreach Start Date**
44	Central Water Front (Alaskan Way Viaduct Replacement)	PBL	0.67	2021	Design	$-	Partnership-dependent	In progress	Waterfront Seattle Framework Plan - 2012
45*	Northgate Light Rail- 1st Ave NE PBL (formerly Northgate Light Rail Station Project (Seg 2)	PBL	0.13	2021	Design	$-	Sound Transit partnership	Sound Transit funded project for walk/bike connection to new Northgate light rail station SDOT is now managing outreach and has started community and property engagement about design and connections	SDOT started August 2018
46	Northgate Light Rail - Northgate Pedestrian and Bicycle Bridge	Trail	0.27	2021	Construction	$-	Sound Transit partnership	Five years of planning and design work with community, neighboring institutions, and light rail station planning Closer to construction Several design iterations over the years; all have retained walk/bike route across freeway connecting to light rail station	February 2014
45*	Northgate Light Rail- 1st Ave NE Multi-Use Path (formerly Northgate Light Rail Station (Seg 3)	Trail	0.38	2021	Design	$-	Sound Transit partnership	Sound Transit funded project for walk/bike connection to new Northgate light rail station SDOT is now managing outreach and has started community and property engagement about design and connections	SDOT started August 2018
45*	Northgate Light Rail- 1st Ave NE PBL (formerly Northgate Light Rail Station Project (Seg 1)	PBL	0.38	2021	Design	$-	Sound Transit partnership	Sound Transit funded project for walk/bike connection to new Northgate light rail station SDOT is now managing outreach and has started community and property engagement about design and connections	SDOT started August 2018
47	SRTS (Washington MS Connection)	NGW	0.60	2021	Design	$350,000	Coordination with Metro	Project is a result of SRTS initiative	
48	Key Arena - Thomas St (Seattle Center to Waterfront)	NGW	0.37	2022	Pre Planning	$90,000	Design limited by available budget	Not Yet Started	
49	Key Arena-Thomas St (Seattle Center to Eastlake)	NGW	0.86	2022	Pre Planning	$400,000	Design limited by available budget	Not Yet Started	
50*	Lake City to Maple Leaf NGW CROSSING	NGW	0.34	2022	Design	$860,000	Coordinate with WSDOT Paving (Requires signal approval)	Design information has been shared with the community in coordination with paving project	

PROJECTS FUNDED THROUGH CONSTRUCTION WITH RISKS									
Project Number	Project Name	Type	Length (miles)	Target year	BMP Project Status	2019-2024 BMP Spending Projection	Risk	Outreach Status	Outreach Start Date
51	SRTS (Emerson ES Connection)	NGW	1.06	2022	Pre Planning	$260,000	Design Dependent on Rainier Phase 3	Not Yet Started	
52	Center City - Bell St PBL	PBL	0.22	2019	Planning	$2,850,000	Coordination with Metro and Private Development. Requires major signal work.	Amazon will install temp paint and post PBL here SDOT and Amazon in dialogue but wider outreach not planned to surrounding community since it's mostly under construction with Amazon projects Will communicate when facility is open and how it connects to new 9th Ave PBL project, which has its own outreach	2015
53*	AAC - 15th Ave NE (AAC Package)-North Segment	PBL	0.94	2020	Design	$1,460,000	Low Risk	Conducted planning outreach with other northeast Seattle paving projects (University Way, 35th Ave NE) Showed design with PBLs and parking removal on one side of long street Paused outreach due to short staffing in late 2018 Restarting design outreach with new staff in spring Will concentrate on new channelization, parking impacts with all properties and business district No organized opposition, support for new north-south PBL connection connecting two east-west PBL facilities	August 2016
53*	AAC - 15th Ave NE (AAC Package)-South Segment	BL	0.25	2020	Design	$-	Low Risk	Same as above	

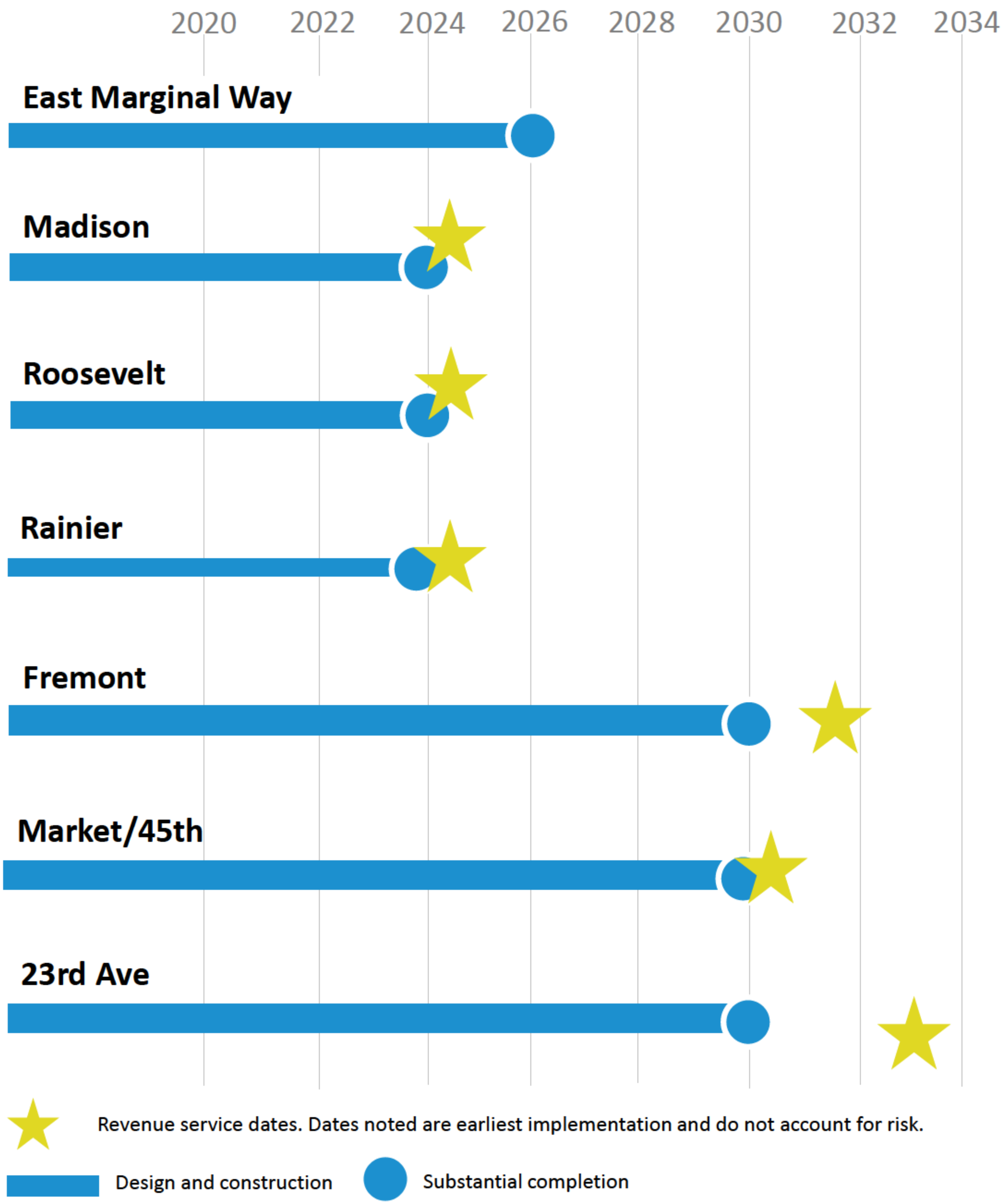
PROJECTS FUNDED THROUGH CONSTRUCTION WITH RISKS									
Project Number	**Project Name**	**Type**	**Length (miles)**	**Target year**	**BMP Project Status**	**2019-2024 BMP Spending Projection**	**Risk**	**Outreach Status**	**Outreach Start Date**
54	Center City -South End Connection	PBL	0.27	2020	Planning	$850,000	Metro and Sound Transit coordination	Conducted planning outreach through Center City work over years Did presentation of route options and a preferred route in 2017 and 2018 Bike board supports an interim facility that gets the connection in even though large parts don't include PBLs, with request that via ST3 a AAA facility is involved Challenging outreach includes moving Seattle Fire parking spaces, changing parking lot ops at homeless service center, complex outreach in Pioneer Square and CID, including request not to impact local businesses or remove parking, which this project shouldn't do much of	2015
55	Multi Modal Corridor-Delridge RR	TBD	3.10	2021	Planning	$-	Transit Plus Multi-modal Corridor dependent	Planning outreach done to utilize adjacent neighborhood greenways and segment of southbound-only PBL on arterial Advocates said they wanted more PBL on the arterial, but that would have meant removing more parking and/or bus lanes Ongoing outreach meetings with advocates who want more upgrades to adjacent greenways Conducted design outreach with Metro in fall 2018 and doing more design outreach in spring	June 2015
35*	Central Ridge Phase 2	NGW	1.41	2024	Design	$2,195,000	Dependent on Madison RapidRide construction	Ongoing outreach; route selected through community process	March 2017
56	AMB: Mt Baker Bicycle Connection	TBD	TBD	2023	Pre Planning	$2,000,000	Preferred route impacts Transit and travel times	10 years of planning processes around light rail station planning and community own center planning 2015 outreach effort with plan to separate intersecting arterials Technical advisory panel convened in 2018 and working on recommendations with outreach in 2019	2018
	Grand Totals		**19.12**			**$37,075,000**			

PROJECTS FUNDED THROUGH DESIGN WITH LOW RISKS									
Project Number	**Project Name**	**Type**	**Length (miles)**	**Target Year**	**BMP Project Status**	**2019-2024 BMP Design Spending Projection**	**Risk**	**Outreach Status**	**Outreach Start Date**
57	SRTS (Stevens ES Connection)	NGW	0.63	2020	Pre Planning	$30,000	Low Risk, Dependent on SRTS partnership	Route recommended through Central Ridge outreach process as SRTS connection	March 2017
58	SRTS (Orca K-8 Connection)	NGW	1.27	2021	Pre Planning	$80,000	Low Risk	Route recommended through Rainier Valley N-S NGW outreach process as SRTS connection	Nov 2014
50*	Lake City/Maple Leaf NGW Connection to Wedgewood	NGW	1.05	2022	Pre Planning	$152,000	Low Risk	Not yet started	
59	SRTS (Beacon Hill ES)	NGW	0.80	2022	Pre Planning	$70,000	Low Risk	Not yet started	
60	E Marginal Way	PBL	1.30	2021	Planning	$400,000	Low Risk, Multi-agency coordination and grant funding	In progress	October 2016
61	Georgetown to South Park	PBL/ Trail	TBD	TBD	Pre Planning	$600,000	Low Risk, Funding and Depending on design, level of service impacts	In progress	2017
	Grand Totals		**5.04**			**$1,332,000**			

PROJECTS FUNDED THROUGH DESIGN WITH KNOWN RISKS									
Project Number	**Project Name**	**Type**	**Length (miles)**	**Target year**	**BMP Project Status**	**2019-2024 BMP Spending Projection**	**Risk**	**Outreach Status**	**Outreach Start Date**
62	VZ- Interurban to Greenwood Connection	NGW	0.25	2020	Pre Planning	$20,000	Partnership-dependent	Not yet started	
63	Lake Washington Loop	NGW	2.31	2024	Design	$200,000	Construction coordination	Route selected through YVYC funded community process. Committed stakeholders are invested in seeing project through construction.	Aug-16
64	Multi Modal Corridor-Roosevelt RR	PBL	3.39	2023	Planning	$-	Fully funded through construction pending FTA funds	In progress	May 2015
65	SRTS (Olympic Hills to Cedar Park)	NGW	1.12	2023	Design	$50,000	Design dependent on signal approval and funding	Not yet started	
66	SODO Trail	Trail	0.42	TBD	Design	$790,000	Multi-agency agreements, funding includes construction costs	On hold	2017
67	Eastlake (Fairview to Stewart)	PBL	0.80	TBD	Planning	$200,000	Multi-agency partnering and funding	In Progress	
	Grand Totals		**8.29**			**$1,260,000**			

PROJECTS REMOVED SINCE 2017 IMPLEMENTATION PLAN			
Project Name	**Type**	**Length (miles)**	**Removal Reason**
35th Ave N PBLs (Paving Project)	PBL	1.20	Removed due to parking and travel impacts
Ballard/Crown Hill to Greenwood	NGW	2.6	SBAB Removed - 2018 Imp Plan; confirmed not a priority project in 2019 Imp Plan
Beacon Hill to Mt Baker Phase 2	NGW	1.5	SBAB Removed - 2019 Imp Plan
Fauntleroy Way SW PBL	PBL	1.3	SBAB Removed - 2019 Imp Plan
Greenwood Ave N PBL	PBL	1.2	SBAB Removed - 2019 Imp Plan
Montlake Blvd NE PBL	PBL	0.6	SBAB Removed - 2019 Imp Plan
NE 100th St PBL	PBL	0.3	SBAB Removed - 2019 Imp Plan
Northgate Light Rail Station Corridor - Segment 4	PBL	0.5	SBAB Removed - 2019 Imp Plan
One Center City - Broad Street PBL	PBL	TBD	SBAB Removed - 2019 Imp Plan
One Center City - Yesler Way PBL	PBL	TBD	SBAB Removed - 2019 Imp Plan
Roosevelt PBL Extension	PBL	0.5	SBAB Removed - 2019 Imp Plan
S Henderson St/Seward Park Ave S	BL	0.7	SBAB Removed - 2019 Imp Plan
Valley Street PBL	PBL	0.3	SBAB Removed - 2019 Imp Plan
12th Ave NE PBL-NE 67th to NE 75th St	PBL	0.5	Partnership - AAC delayed to after the Levy
N 130th St 2021 Paving	PBL	1.6	Partnership - AAC delayed to after the Levy
SW Roxbury 2021 Paving	PBL	1	Partnership - AAC delayed to after the Levy
NW Market St 2020 Paving	BL	0.6	Partnership - AAC Extents changed
Market/45th Transit Improvement Area	TBD	0.5	Partnership - No longer funded as a multi-modal corridor
Rainier Ave S Paving/RR	PBL	0.9	To mitigate risk, project designed to match funding. Focus on spot transit improvements
First Hill Streetcar: Broadway Extension	PBL	0.6	Project remains in BMP. Partnership - Streetcar Project put on hold.
Chief Sealth Trail Connections	TRL	0.3	City Light Coordination
Fauntleroy Way SW Boulevard	PBL	0.3	Fauntleroy Blvd. project put on hold
Madison MMC Complementary: 9th/University/Union	NGW	0.5	Previously considered with Madison BRT complementary route.
Madison MMC Complementary: Arthur/27th	NGW	0.8	Previously considered with Madison BRT complementary route.
Madison MMC Complementary: Thomas/24th	NGW	0.8	Previously considered with Madison BRT complementary route.
N 40th St (2019 AAC package)	PBL	0.29	Removed due to design constraints & funding risk.
Madison MMC Complementary: Denny Way	NGW	0.76	Previously considered with Madison BRT complementary route.
West Seattle North Admiral Connection	NGW	1.94	Removed due to design constraints & funding risk.
15th Ave S AAC Coordination (16th Ave S NGW)	NGW	0.28	Bike Lanes in previous plan. Complete streets evaluation resulted in parallel greenway on 16th as recommended. However, NGW Connection dependent upon NSF project currently in design review.
S Alaska St Connection: Columbia City	NGW	0.42	Stakeholder investment in connection. Removed due to design constraints & funding risk.
S Alaska St PBL	PBL	0.29	Stakeholder investment in connection. Removed due to design constraints & funding risk.
Beacon Ave S PBL Study Only	PBL	0.87	SBAB Removed - 2019 Imp Plan
Myers Way S	PBL	1.24	SBAB Recommended for 2019 plan. Removed due to design constraints & funding risk.
Center City: Alaskan (Virginia to Elliot Bay Trail)	TBD	0.38	Did not receive grant or private funding.
Grand Total		**25.57**	

Delivery timelines



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Corridor	Scope of Work	TOTAL WORKPLAN (incl Non-Secured)	Secured Funding	LEVY	LOCAL	LEVERAGE	Source (Non-Secured)	Status (Non-Secured Funds)	Amount
Madison	Rapid Ride	$121M	$32.6M	$15M	$1.9M	$15.7M			$88.4M
							Small Starts (FTA)	Unsecured (Application submitted, project rated, NEPA approved)	$59.9M
							ST3	Likely (Agreement to be negotiated)	$28.5M
Delridge	Rapid Ride	~~$34.8~~ $33.8M	$19.8M	$9.5M	$0.3M	$10M			~~$15.0M~~ $14.0M
							Metro	Likely (Currently in negotiation, Seattle segment amount TBD, 2019-2020 KCM budget includes $57.2M for overall project)	~~$15.0M~~ $14.0M
Roosevelt	Rapid Ride	~~$85.7M~~ $79.7M	$14.9M	$8.5M	$0.9M	$5.4M			~~$70.8M~~ $64.8M
							Small Starts (FTA)	Unsecured (Application submitted, project rated)	$45.0M
							Metro	Unsecured (2019-2024 KCM budget includes $27.7M)	$19.8M
							~~RMG (State)~~	~~Unsecured (July 2018 competition)~~ – Did not receive grant	~~$6.0M~~ $0
Rainier	Transit Speed and Reliability Improvements	~~$16.3M~~ $8.5M	~~$16.3M*~~ $8.5M	$8.5M	$0	~~$7.8M~~ $0 (The 5307 & CMAQ grants have been transferred to Metro)			$0
							N/A	N/A	
Fremont	Transit Speed and Reliability Improvements	$22.9M	$12.9M	$9.5M	$0	$3.4M			$10M
							CMAQ (FHWA)	Unsecured (2020 competition)	$4.0M
							RMG (State)	Unsecured (2020 competition)	$4.0M
							5307 (FTA)	Unsecured (2020 competition)	$2.0M
Market/45th	Transit Speed and Reliability Improvements	~~$15.6M~~ $18.05M	$9.6M	$9.5M	$0.05M	$0			~~$6M~~ $8.5M
							RMG (State)	Unsecured (July 2018 competition)	$6.0M
							UW MIMP	Unsecured (pending agreement completion) – THIS IS NEW	$2.5M
23rd Ave	Transit Speed and Reliability Improvements**	$8M	$0						$8M
							RMG (State)	Unsecured (2020 competition)	$4.0M
							CMAQ (FHWA)	Unsecured (2020 competition)	$4.0M
TOTALS		~~$304.3M~~ **$291.95M**	~~$106.1M~~ **$98.3M**	$60.5M	$3.2M	~~$42.3M~~ $34.5M			~~$198.2M~~ **$193.7M**

* Note: $7.7M of secured funds are from federal sources (FTA & FHWA). These grants were secured based on a RapidRide scope of work. SDOT and King County Metro are assessing joint and separate delivery options, which would result in delaying levy investments to match Metro's timeline or returning federal funds.

**Note: this is not yet a CIP.

Items crossed out indicate changes from the Levy Assessment (published November 2018).

Modest rounding differences exist due to nearest $0.5M assumptions.

From: Adkins, Genesee
To: Zimbabwe, Sam; Helmbrecht, Elliot
Subject: AHR Materials for 2:00
Date: Thursday, April 18, 2019 1:55:45 PM
Attachments: BMP_Tables.pdf
CorridorProjectDeliveryTimelineDocument_0418_2019_Updated.pptx
Theory XYZ spending plan 041819.xlsx
Transit Plus Multimodal Corridors_funding scenario 041719.docx
image001.png
image002.png

Sam, Elliot,

I'm bringing 20 each of these for the 2:00 briefing. Perhaps you won't want to hand out any of these, and the memo alone will cover the bases for today, but we have these ready in case they're helpful.

Thanks and break a leg,

Genesee

Genesee C. Adkins
Chief of Staff
City of Seattle Department of Transportation
O: 206-615-1963 | M: 206-492-3395 | genesee.adkins@seattle.gov

PROJECTS FUNDED THROUGH CONSTRUCTION WITH LOW RISKS									
Project Number	**Project Name**	**Type**	**Length (miles)**	**Target year**	**BMP Project Status**	**2019-2024 BMP Spending Projection**	**Risk**	**Outreach Status**	**Outreach Start Date**
1	AAC - S Columbian Way/S Alaska St (2018 AAC Package)	PBL	1.11	2019	Construction	$790,000	Low Risk	Construction outreach, on-the-ground Issue with parking across PBL in gravel shoulder	August 2016
2	AAC - S Dearborn St	PBL	0.46	2019	Construction	$200,000	Low Risk	Done	August 2016
3	AAC - Swift/Myrtle/ Othello (2018 AAC Package)	PBL	1.75	2019	Construction	$243,000	Low Risk	Construction outreach, on-the-ground Some parking removal	August 2016
4	AAC - Wilson Ave S (2018 AAC Package)	PBL	0.81	2019	Construction	$264,000	Low Risk	Construction outreach, on-the-ground Removes one side of parking; organize neighborhood opposition to parking removal Advocates support project	August 2016
Spot	Aurora and 83rd signal (2019 AAC Package)	Other	0 (spot)	2019	Design	$600,000	Low Risk, requires WSDOT Coordination	Spoken with all surrounding properties about outdated intersection design and safety improvements coming after injuries/fatality	
5	MMC - Union PBL	PBL	0.67	2019	Planning	$400,000	Low Risk	In progress	March 2015 (In coordination with the Madison MM project)
6*	NE 70th St PBL	PBL	0.10	2019	Construction	$100,000	Low Risk, requires WSDOT Coordination	Construction outreach, on-the-ground Removes parking from both sides of street for three blocks Community-requested project through the Neighborhood Street Fund process	February 2018
6*	NE 70th St Connection to PBL	NGW	0.17	2019	Construction	$-	Low Risk, connects to WSDOT Coordinated PBL	Construction outreach, on-the-ground Removes parking from one side of street Community-requested project through the Neighborhood Street Fund process	
7	North Seattle NGW	NGW	2.70	2019	Construction	$870,000	Low Risk	Construction outreach, on-the-ground; almost done Add two traffic diverters, which have mixed feedback about circulation	July 2016
8	SRTS (High Point Loop)	NGW	0.88	2019	Construction	$250,000	Low Risk	Construction outreach, on-the-ground No major issues	Nov 2016
9	VZ - NE 65th St Vision Zero Safety Corridor	PBL	0.74	2019	Construction	$1,150,000	Low Risk	In progress (almost done)	February 2017

PROJECTS FUNDED THROUGH CONSTRUCTION WITH LOW RISKS									
Project Number	Project Name	Type	Length (miles)	Target year	BMP Project Status	2019-2024 BMP Spending Projection	Risk	Outreach Status	Outreach Start Date
10	West Seattle Phase 1	NGW	2.21	2019	Construction	$500,000	Low Risk	Construction outreach, on-the-ground No major issues	Nov 2016
11	12th Ave S PBL- Golf Dr to S King St	PBL	0.25	2020	Planning	$350,000	Low Risk, requires Load Zone & Transit Access Coordination	In Progress; working with community on load zones and transit access	October 2018
12	AAC - Green Lake Park Loop (2019 AAC Package)	PBL	2.55	2020	Design	$4,400,000	Low Risk, requires Right of Way acquisition, requires coordination with Parks.	Pre-construction outreach, on-the-ground Major paving on busy arterials Interagency coordination with Parks Adds PBLs around most of the lake, reconfigures intersections, changes parking in some areas Two years of outreach, meetings, mailings, briefings	April 2017
13	AAC - N 50th St (2019 AAC Package)	BL	0.27	2020	Design	$360,000	Low Risk	Part of Green Lake paving outreach above, but no major rechannelization	April 2017
Spot	AAC - N 80th St (2019 AAC Package)-Green Lake PBL	Other	0 (spot)	2020	Design	$370,000	Low Risk	Part of Green Lake paving outreach above, but no major rechannelization	April 2017
14	AAC - SW Avalon Way and 35th Ave SW (2019 AAC Package)	PBL	0.90	2020	Design	$1,300,000	Low Risk, requires Load Zone & Transit Access Coordination	Pre-construction outreach, on-the-ground Major paving on busy arterials Adds PBLs and removes some parking and all center turn lane Focus of CM Herbold Opposed by business/property owner because of parking removal Covered closely by West Seattle Blog Two years of outreach, meetings, mailings, briefings	April 2017
15	Center City - 9th Ave N	PBL	0.24	2020	Planning	$300,000	Low Risk, requires Private Development Coordination	Design outreach done with Parks Starting outreach with SLU Saturday market and properties this spring	Since 2016
16	Green Lake to Interurban Connection	NGW	0.38	2020	Planning	$100,000	Low Risk	Neighborhood stakeholders requesting earlier implementation; project outreach not yet started	
17	Judkins Park Connection	NGW	0.26	2020	Design	$70,000	Low Risk	Ongoing outreach	August 2016

PROJECTS FUNDED THROUGH CONSTRUCTION WITH LOW RISKS									
Project Number	**Project Name**	**Type**	**Length (miles)**	**Target year**	**BMP Project Status**	**2019-2024 BMP Spending Projection**	**Risk**	**Outreach Status**	**Outreach Start Date**
18*	Melrose Promenade (NGW segment)	NGW	0.83	2020	Planning	$2,600,000	Low Risk	Ongoing outreach, but few interactions because it's pavement repair, speed humps, and sharrows	February 2018
18*	Melrose Promenade (PBL segment)	PBL	0.10	2020	Planning	$600,000	Low Risk, potential for minor parking and loading impacts	Concept planning done Focused conversations with property owners in Pike-Pine block to widen sidewalk, which we're doing Currently doing outreach for new PBLs and parking removal in Olive-Denny blocks Meeting some opposition to load zone relocations and parking removal from condo/apartments	February 2018
19	N 34th St Mobility Improvements	PBL	0.33	2020	Planning	$1,600,000	Low Risk	Concept and planning outreach done Advocates' preferred alternative of two-way PBL not moving forward; pair of PBLs instead No major opposition Continue to have community and property conversations about design at each milestone	Fall 2017
20	NGW Connection to Missing Link 1	NGW	0.35	2020	Design	$90,000	Low Risk, Dependent upon Missing Link project	Not yet started	
21	NGW Connection to Missing Link 2	NGW	0.05	2020	Design	$20,000	Low Risk, Dependent upon Missing Link project	Not yet started	
22	S Lander Street Bridge	Trail	0.24	2020	Design	$-	Low Risk	Major construction of new bridge Construction outreach, on the ground Continued frustration in advocate community that new bridge includes one sidewalk not two	
23	SRTS (Highland Park Connection Ph 1)	NGW	1.45	2020	Pre Planning	$340,000	Low Risk	Not yet started	
24	SRTS (Lowell - Meany Connection)	NGW	0.79	2020	Design	$190,000	Low Risk	Continued conversations with community about which streets and intersections make best routes for schools and kids Doing outreach about intersection changes ahead of construction	

PROJECTS FUNDED THROUGH CONSTRUCTION WITH LOW RISKS									
Project Number	Project Name	Type	Length (miles)	Target year	BMP Project Status	2019-2024 BMP Spending Projection	Risk	Outreach Status	Outreach Start Date
25	SRTS (Viewlands Connection)	NGW	1.09	2020	Pre Planning	$260,000	Low Risk	Not yet started	
26	SRTS (Wing Luke Elementary Connection)	NGW	0.80	2020	Design	$300,000	Low Risk	Not yet started	
27	West Seattle Phase 2a	NGW	0.17	2020	Design	$1,000,000	Low Risk	Ongoing outreach; new signal with turn restrictions will address collision location and improve mobility	Nov 2016
28	Northgate to Maple Leaf Light Rail Connection	NGW	1.13	2021	Design	$480,000	Low Risk	Ongoing outreach; route selected to connect people to Northgate light rail for 2021 opening	March 2017
29	Northgate to Pinehurst Light Rail Connection	NGW	1.12	2021	Design	$470,000	Low Risk	Ongoing outreach; route selected to connect people to Northgate light rail for 2021 opening	March 2017
30	SRTS (Ingraham HS Connection Ph 1)	NGW	1.25	2021	Planning	$800,000	Low Risk	Initial outreach has begun in conjunction with N 130th Station Access planning	March 2019
31	West Seattle - 35th Ave SW Alternative - Camp Long Connection	NGW	0.72	2021	Design	$177,000	Low Risk, Dependent upon VZ signal project	Not yet started	
32	West Seattle Phase 2b	NGW	1.21	2020	Design	$1,300,000	Low Risk	Ongoing outreach; route selected by community to connect with West Seattle Junction	Nov 2016
33	SRTS (Hazel Wolf K-8) Pinehurst Connection	NGW	0.89	2022	Pre Planning	$220,000	Low Risk, Dependent upon SRTS/PMP signal project	Not yet started	
34*	4th Segment 1 (Pine to Spring)	PBL	0.36	2020	Design	$500,000	Low Risk, potential for parking and loading impacts	Parking impacts, coordination with Hotel Monaco about load zones.	2015'
35*	Central Ridge Phase 1	NGW	0.75	2020	Design	$480,000	Low Risk, Previous commitment	Ongoing outreach; route selected through community process; improvements coordinated with private development SIP	March 2017
	7th Ave	PBL	0.20	2020			Low Risk, construction by Amazon	In progress	2017
	Battery St	BL	0.20	2020			Low Risk, construction by WSDOT		
	Grand Totals		**30.49**			**$24,044,000**			

PROJECTS FUNDED THROUGH CONSTRUCTION WITH RISKS									
Project Number	Project Name	Type	Length (miles)	Target year	BMP Project Status	2019-2024 BMP Spending Projection	Risk	Outreach Status	Outreach Start Date
34*	Center City - 4th Ave (segment 2 Vine to Pine)	PBL	0.61	2021	Design	$1,100,000	Funding and Depending on design, level of service impacts, paving impacts	Outreach large downtown stakeholders includes: Safeco Plaza, Unico/U of W, Macy's Building, Westlake Center, Securities Parking Garage, Dahlia Lounge, Shelby apartments, Security House Building and others.	2015
34*	Center City - 4th Ave (segment 3 Spring to Main)	PBL	0.53	2021	Design	$1,100,000	Funding and Depending on design, level of service impacts, paving impacts	Same as above	2015
36*	Center City - 8th Ave -Interim	PBL	0.55	2019	Planning	$600,000	Potential for parking and loading impacts	Concept of 7th/8th PBL couplet shared for years This year started high level property owner and downtown resident/business group outreach In Spring will meet with all property owners/ managers about PBL design specifics No organized opposition to concept at this time Will work through parking and lane shifts with each property and learn more	2015
37*	Center City - Pike/Pine Interim	PBL	0.60	2019	Planning	$800,000	Potential for parking and loading impacts	Concept of Pike/Pine PBLs shared for years Community and advocate priority Last year started high level property owner and downtown resident/business group outreach Advocates/community did own outreach in fall 2018 In Spring will meet with all property owners/ managers about PBL design There will be parking removal from at least half of Pike St on Capitol Hill Will work through parking and lane shifts with each property and learn more	2015
38	King Street - 2019/2020 Delivery	NGW	1.05	2019	Design	$2,500,000	Private development to construct part	Years of concept and design outreach are done Doing pre-construction outreach in close contact with CID stakeholders	Aug 2016
39	Burke Gilman Trail - Missing Link	Trail	1.42	2020	Design	$200,000	Legal challenges	Organized opposition to project Organize support of project Working through legal issues	Current Iteration - 2013

PROJECTS FUNDED THROUGH CONSTRUCTION WITH RISKS									
Project Number	Project Name	Type	Length (miles)	Target year	BMP Project Status	2019-2024 BMP Spending Projection	Risk	Outreach Status	Outreach Start Date
40*	Key Arena - NODO - Queen Anne/1st	PBL	0.47	2020	Pre Planning	$-	Private Developer to design and construct	Concept of PBL couplet from advocates and reflected in North Downtown Mobility Plan	October 2018
40*	Key Arena - NODO - 1st/ Broad st	PBL	0.25	2020	Pre Planning	$-	Partnership-dependent		October 2018
Spot	King Street - 12th & King	NGW	0 (spot)	2020	Design	$630,000	Design to coordinate with adjacent projects	Years of concept and design outreach are done Intersection construction delayed 1 year for coordination with 12th Ave S project; Interim project to be installed in 2019	Aug 2016
Spot	King Street - Under I-5	NGW	0 (spot)	2020	Design	$1,180,000	Funding risk	Scope is result of extensive community outreach on the need for improved pedestrian lighting to connect people walking under I-5	Aug 2016
41	Rainier Valley N-S Phase 2	NGW	0.67	2020	Design	$160,000	Requires trail lease agreement WSDOT	Ongoing outreach	Nov 2014
42	SRTS (Lincoln HS Connection)	NGW	0.35	2020	Planning	$1,060,000	Potential for parking and loading impacts	Outreach to be coordinated with Stone Way Paving; NGW outreach not yet begun	
43	VZ -Wedgwood to Roosevelt Connection	NGW	1.39	2020	Design	$430,000	Coordinate with 15th AAC	Project has been introduced to community through NE 65th St Vision Zero project; future NGW specific outreach will focus on construction	
36*	Center City - 8th Ave	PBL	Mileage will match interim design	2021	Planning	$6,000,000	SDOT contractually obligated by Washington state convention center on funding amounts	CCBN paint-and-post outreach happening now Long-term, permanent facility is mentioned by the CCBN project team New outreach will be done when permanent facility gets closer to construction	WSCC Community Benefits Package - 2017
37*	Center City - Pike/Pine	PBL	Mileage will match interim design	2021	Planning	$10,000,000	SDOT contractually obligated by Washington state convention center on funding amounts	CCBN paint-and-post outreach happening now Long-term, permanent facility is mentioned by the CCBN project team New outreach will be done when permanent facility gets closer to construction Would work closely with outreach for Pike Pine Renaissance project funded by Waterfront	WSCC Community Benefits Package - 2017

PROJECTS FUNDED THROUGH CONSTRUCTION WITH RISKS									
Project Number	**Project Name**	**Type**	**Length (miles)**	**Target year**	**BMP Project Status**	**2019-2024 BMP Spending Projection**	**Risk**	**Outreach Status**	**Outreach Start Date**
44	Central Water Front (Alaskan Way Viaduct Replacement)	PBL	0.67	2021	Design	$-	Partnership-dependent	In progress	Waterfront Seattle Framework Plan - 2012
45*	Northgate Light Rail- 1st Ave NE PBL (formerly Northgate Light Rail Station Project (Seg 2)	PBL	0.13	2021	Design	$-	Sound Transit partnership	Sound Transit funded project for walk/bike connection to new Northgate light rail station SDOT is now managing outreach and has started community and property engagement about design and connections	SDOT started August 2018
46	Northgate Light Rail - Northgate Pedestrian and Bicycle Bridge	Trail	0.27	2021	Construction	$-	Sound Transit partnership	Five years of planning and design work with community, neighboring institutions, and light rail station planning Closer to construction Several design iterations over the years; all have retained walk/bike route across freeway connecting to light rail station	February 2014
45*	Northgate Light Rail- 1st Ave NE Multi-Use Path (formerly Northgate Light Rail Station (Seg 3)	Trail	0.38	2021	Design	$-	Sound Transit partnership	Sound Transit funded project for walk/bike connection to new Northgate light rail station SDOT is now managing outreach and has started community and property engagement about design and connections	SDOT started August 2018
45*	Northgate Light Rail- 1st Ave NE PBL (formerly Northgate Light Rail Station Project (Seg 1)	PBL	0.38	2021	Design	$-	Sound Transit partnership	Sound Transit funded project for walk/bike connection to new Northgate light rail station SDOT is now managing outreach and has started community and property engagement about design and connections	SDOT started August 2018
47	SRTS (Washington MS Connection)	NGW	0.60	2021	Design	$350,000	Coordination with Metro	Project is a result of SRTS initiative	
48	Key Arena - Thomas St (Seattle Center to Waterfront)	NGW	0.37	2022	Pre Planning	$90,000	Design limited by available budget	Not Yet Started	
49	Key Arena-Thomas St (Seattle Center to Eastlake)	NGW	0.86	2022	Pre Planning	$400,000	Design limited by available budget	Not Yet Started	
50*	Lake City to Maple Leaf NGW CROSSING	NGW	0.34	2022	Design	$860,000	Coordinate with WSDOT Paving (Requires signal approval)	Design information has been shared with the community in coordination with paving project	

PROJECTS FUNDED THROUGH CONSTRUCTION WITH RISKS									
Project Number	Project Name	Type	Length (miles)	Target year	BMP Project Status	2019-2024 BMP Spending Projection	Risk	Outreach Status	Outreach Start Date
51	SRTS (Emerson ES Connection)	NGW	1.06	2022	Pre Planning	$260,000	Design Dependent on Rainier Phase 3	Not Yet Started	
52	Center City - Bell St PBL	PBL	0.22	2019	Planning	$2,850,000	Coordination with Metro and Private Development. Requires major signal work.	Amazon will install temp paint and post PBL here SDOT and Amazon in dialogue but wider outreach not planned to surrounding community since it's mostly under construction with Amazon projects Will communicate when facility is open and how it connects to new 9th Ave PBL project, which has its own outreach	2015
53*	AAC - 15th Ave NE (AAC Package)-North Segment	PBL	0.94	2020	Design	$1,460,000	Low Risk	Conducted planning outreach with other northeast Seattle paving projects (University Way, 35th Ave NE) Showed design with PBLs and parking removal on one side of long street Paused outreach due to short staffing in late 2018 Restarting design outreach with new staff in spring Will concentrate on new channelization, parking impacts with all properties and business district No organized opposition, support for new north-south PBL connection connecting two east-west PBL facilities	August 2016
53*	AAC - 15th Ave NE (AAC Package)-South Segment	BL	0.25	2020	Design	$-	Low Risk	Same as above	

PROJECTS FUNDED THROUGH CONSTRUCTION WITH RISKS									
Project Number	**Project Name**	**Type**	**Length (miles)**	**Target year**	**BMP Project Status**	**2019-2024 BMP Spending Projection**	**Risk**	**Outreach Status**	**Outreach Start Date**
54	Center City -South End Connection	PBL	0.27	2020	Planning	$850,000	Metro and Sound Transit coordination	Conducted planning outreach through Center City work over years Did presentation of route options and a preferred route in 2017 and 2018 Bike board supports an interim facility that gets the connection in even though large parts don't include PBLs, with request that via ST3 a AAA facility is involved Challenging outreach includes moving Seattle Fire parking spaces, changing parking lot ops at homeless service center, complex outreach in Pioneer Square and CID, including request not to impact local businesses or remove parking, which this project shouldn't do much of	2015
55	Multi Modal Corridor-Delridge RR	TBD	3.10	2021	Planning	$-	Transit Plus Multi-modal Corridor dependent	Planning outreach done to utilize adjacent neighborhood greenways and segment of southbound-only PBL on arterial Advocates said they wanted more PBL on the arterial, but that would have meant removing more parking and/or bus lanes Ongoing outreach meetings with advocates who want more upgrades to adjacent greenways Conducted design outreach with Metro in fall 2018 and doing more design outreach in spring	June 2015
35*	Central Ridge Phase 2	NGW	1.41	2024	Design	$2,195,000	Dependent on Madison RapidRide construction	Ongoing outreach; route selected through community process	March 2017
56	AMB: Mt Baker Bicycle Connection	TBD	TBD	2023	Pre Planning	$2,000,000	Preferred route impacts Transit and travel times	10 years of planning processes around light rail station planning and community own center planning 2015 outreach effort with plan to separate intersecting arterials Technical advisory panel convened in 2018 and working on recommendations with outreach in 2019	2018
	Grand Totals		**19.12**			**$37,075,000**			

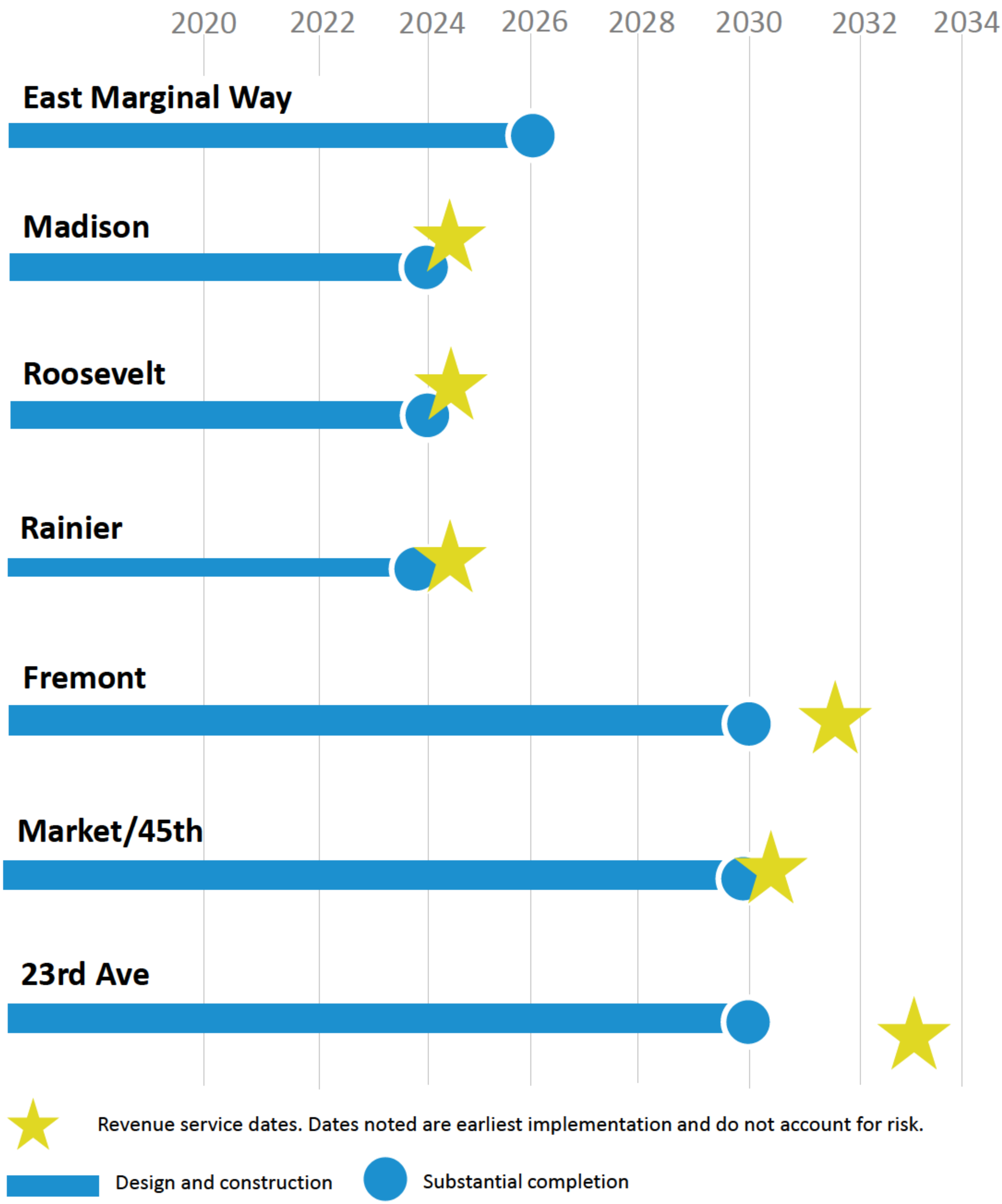
PROJECTS FUNDED THROUGH DESIGN WITH LOW RISKS

Project Number	Project Name	Type	Length (miles)	Target Year	BMP Project Status	2019-2024 BMP Design Spending Projection	Risk	Outreach Status	Outreach Start Date
57	SRTS (Stevens ES Connection)	NGW	0.63	2020	Pre Planning	$30,000	Low Risk, Dependent on SRTS partnership	Route recommended through Central Ridge outreach process as SRTS connection	March 2017
58	SRTS (Orca K-8 Connection)	NGW	1.27	2021	Pre Planning	$80,000	Low Risk	Route recommended through Rainier Valley N-S NGW outreach process as SRTS connection	Nov 2014
50*	Lake City/Maple Leaf NGW Connection to Wedgewood	NGW	1.05	2022	Pre Planning	$152,000	Low Risk	Not yet started	
59	SRTS (Beacon Hill ES)	NGW	0.80	2022	Pre Planning	$70,000	Low Risk	Not yet started	
60	E Marginal Way	PBL	1.30	2021	Planning	$400,000	Low Risk, Multi-agency coordination and grant funding	In progress	October 2016
61	Georgetown to South Park	PBL/ Trail	TBD	TBD	Pre Planning	$600,000	Low Risk, Funding and Depending on design, level of service impacts	In progress	2017
	Grand Totals		**5.04**			**$1,332,000**			

PROJECTS FUNDED THROUGH DESIGN WITH KNOWN RISKS									
Project Number	**Project Name**	**Type**	**Length (miles)**	**Target year**	**BMP Project Status**	**2019-2024 BMP Spending Projection**	**Risk**	**Outreach Status**	**Outreach Start Date**
62	VZ- Interurban to Greenwood Connection	NGW	0.25	2020	Pre Planning	$20,000	Partnership-dependent	Not yet started	
63	Lake Washington Loop	NGW	2.31	2024	Design	$200,000	Construction coordination	Route selected through YVYC funded community process. Committed stakeholders are invested in seeing project through construction.	Aug-16
64	Multi Modal Corridor-Roosevelt RR	PBL	3.39	2023	Planning	$-	Fully funded through construction pending FTA funds	In progress	May 2015
65	SRTS (Olympic Hills to Cedar Park)	NGW	1.12	2023	Design	$50,000	Design dependent on signal approval and funding	Not yet started	
66	SODO Trail	Trail	0.42	TBD	Design	$790,000	Multi-agency agreements, funding includes construction costs	On hold	2017
67	Eastlake (Fairview to Stewart)	PBL	0.80	TBD	Planning	$200,000	Multi-agency partnering and funding	In Progress	
	Grand Totals		**8.29**			**$1,260,000**			

PROJECTS REMOVED SINCE 2017 IMPLEMENTATION PLAN			
Project Name	**Type**	**Length (miles)**	**Removal Reason**
35th Ave N PBLs (Paving Project)	PBL	1.20	Removed due to parking and travel impacts
Ballard/Crown Hill to Greenwood	NGW	2.6	SBAB Removed - 2018 Imp Plan; confirmed not a priority project in 2019 Imp Plan
Beacon Hill to Mt Baker Phase 2	NGW	1.5	SBAB Removed - 2019 Imp Plan
Fauntleroy Way SW PBL	PBL	1.3	SBAB Removed - 2019 Imp Plan
Greenwood Ave N PBL	PBL	1.2	SBAB Removed - 2019 Imp Plan
Montlake Blvd NE PBL	PBL	0.6	SBAB Removed - 2019 Imp Plan
NE 100th St PBL	PBL	0.3	SBAB Removed - 2019 Imp Plan
Northgate Light Rail Station Corridor - Segment 4	PBL	0.5	SBAB Removed - 2019 Imp Plan
One Center City - Broad Street PBL	PBL	TBD	SBAB Removed - 2019 Imp Plan
One Center City - Yesler Way PBL	PBL	TBD	SBAB Removed - 2019 Imp Plan
Roosevelt PBL Extension	PBL	0.5	SBAB Removed - 2019 Imp Plan
S Henderson St/Seward Park Ave S	BL	0.7	SBAB Removed - 2019 Imp Plan
Valley Street PBL	PBL	0.3	SBAB Removed - 2019 Imp Plan
12th Ave NE PBL-NE 67th to NE 75th St	PBL	0.5	Partnership - AAC delayed to after the Levy
N 130th St 2021 Paving	PBL	1.6	Partnership - AAC delayed to after the Levy
SW Roxbury 2021 Paving	PBL	1	Partnership - AAC delayed to after the Levy
NW Market St 2020 Paving	BL	0.6	Partnership - AAC Extents changed
Market/45th Transit Improvement Area	TBD	0.5	Partnership - No longer funded as a multi-modal corridor
Rainier Ave S Paving/RR	PBL	0.9	To mitigate risk, project designed to match funding. Focus on spot transit improvements
First Hill Streetcar: Broadway Extension	PBL	0.6	Project remains in BMP. Partnership - Streetcar Project put on hold.
Chief Sealth Trail Connections	TRL	0.3	City Light Coordination
Fauntleroy Way SW Boulevard	PBL	0.3	Fauntleroy Blvd. project put on hold
Madison MMC Complementary: 9th/University/Union	NGW	0.5	Previously considered with Madison BRT complementary route.
Madison MMC Complementary: Arthur/27th	NGW	0.8	Previously considered with Madison BRT complementary route.
Madison MMC Complementary: Thomas/24th	NGW	0.8	Previously considered with Madison BRT complementary route.
N 40th St (2019 AAC package)	PBL	0.29	Removed due to design constraints & funding risk.
Madison MMC Complementary: Denny Way	NGW	0.76	Previously considered with Madison BRT complementary route.
West Seattle North Admiral Connection	NGW	1.94	Removed due to design constraints & funding risk.
15th Ave S AAC Coordination (16th Ave S NGW)	NGW	0.28	Bike Lanes in previous plan. Complete streets evaluation resulted in parallel greenway on 16th as recommended. However, NGW Connection dependent upon NSF project currently in design review.
S Alaska St Connection: Columbia City	NGW	0.42	Stakeholder investment in connection. Removed due to design constraints & funding risk.
S Alaska St PBL	PBL	0.29	Stakeholder investment in connection. Removed due to design constraints & funding risk.
Beacon Ave S PBL Study Only	PBL	0.87	SBAB Removed - 2019 Imp Plan
Myers Way S	PBL	1.24	SBAB Recommended for 2019 plan. Removed due to design constraints & funding risk.
Center City: Alaskan (Virginia to Elliot Bay Trail)	TBD	0.38	Did not receive grant or private funding.
Grand Total		**25.57**	

Delivery timelines



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Corridor	Scope of Work	TOTAL WORKPLAN (incl Non-Secured)	Secured Funding	LEVY	LOCAL	LEVERAGE	Source (Non-Secured)	Status (Non-Secured Funds)	Amount
Madison	Rapid Ride	$121M	$32.6M	$15M	$1.9M	$15.7M			$88.4M
							Small Starts (FTA)	Unsecured (Application submitted, project rated, NEPA approved)	$59.9M
							ST3	Likely (Agreement to be negotiated)	$28.5M
Delridge	Rapid Ride	~~$34.8~~ $33.8M	$19.8M	$9.5M	$0.3M	$10M			~~$15.0M~~ $14.0M
							Metro	Likely (Currently in negotiation, Seattle segment amount TBD, 2019-2020 KCM budget includes $57.2M for overall project)	~~$15.0M~~ $14.0M
Roosevelt	Rapid Ride	~~$85.7M~~ $79.7M	$14.9M	$8.5M	$0.9M	$5.4M			~~$70.8M~~ $64.8M
							Small Starts (FTA)	Unsecured (Application submitted, project rated)	$45.0M
							Metro	Unsecured (2019-2024 KCM budget includes $27.7M)	$19.8M
							~~RMG (State)~~	~~Unsecured (July 2018 competition)~~ – Did not receive grant	~~$6.0M~~ $0
Rainier	Transit Speed and Reliability Improvements	~~$16.3M~~ $8.5M	~~$16.3M*~~ $8.5M	$8.5M	$0	~~$7.8M~~ $0 (The 5307 & CMAQ grants have been transferred to Metro)			$0
							N/A	N/A	
Fremont	Transit Speed and Reliability Improvements	$22.9M	$12.9M	$9.5M	$0	$3.4M			$10M
							CMAQ (FHWA)	Unsecured (2020 competition)	$4.0M
							RMG (State)	Unsecured (2020 competition)	$4.0M
							5307 (FTA)	Unsecured (2020 competition)	$2.0M
Market/45th	Transit Speed and Reliability Improvements	~~$15.6M~~ $18.05M	$9.6M	$9.5M	$0.05M	$0			~~$6M~~ $8.5M
							RMG (State)	Unsecured (July 2018 competition)	$6.0M
							UW MIMP	Unsecured (pending agreement completion) – THIS IS NEW	$2.5M
23rd Ave	Transit Speed and Reliability Improvements**	$8M	$0						$8M
							RMG (State)	Unsecured (2020 competition)	$4.0M
							CMAQ (FHWA)	Unsecured (2020 competition)	$4.0M
TOTALS		**~~$304.3M~~ $291.95M**	**~~$106.1M~~ $98.3M**	$60.5M	$3.2M	~~$42.3M~~ $34.5M			**~~$198.2M~~ $193.7M**

* Note: $7.7M of secured funds are from federal sources (FTA & FHWA). These grants were secured based on a RapidRide scope of work. SDOT and King County Metro are assessing joint and separate delivery options, which would result in delaying levy investments to match Metro's timeline or returning federal funds.

**Note: this is not yet a CIP.

Items crossed out indicate changes from the Levy Assessment (published November 2018).

Modest rounding differences exist due to nearest $0.5M assumptions.

From: Simpson, Kristen
To: Adkins, Genesee; Helmbrecht, Elliot; Krawczyk, Tracy
Subject: draft pricing materials
Date: Friday, January 18, 2019 4:45:05 PM
Attachments: image001.jpg
Draft Messaging Best Practices White Paper_20181206.docx
DRAFT Opportunity Statements_20190117.pdf
DRAFT Seattle Pricing and Equity White Paper_20190102.docx
image003.jpg

Hi Genesee, Tracy and Elliot,

The draft materials you'll be seeing for review are listed below, along with when you'll see each. Most of them could be combined into a consolidated report, but for now they are separate.

1. A draft Pricing and Equity white paper (attached)
2. A draft Messaging and Comms Best Practices white paper (attached)
3. A draft Opportunity Statements piece (attached) – this is a first cut at something that could be used in the initial stakeholder conversations. Note that page 10 is being revised to focus more on transit needs.
4. A draft Impacts and Benefits white paper – (early next week)
5. A draft Pricing Tools, Technologies and Legalities white paper (early next week)
6. A draft Pricing Tools Screening Memo (early next week)
7. A draft executive summary (Wednesday 1/23)

Kristen

Kristen Simpson, AICP
Revenue and Capital Development Manager
City of Seattle, Department of Transportation
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DRAFT CONGESTION PRICING MESSAGING AND COMMUNICATIONS BEST PRACTICES WHITE PAPER (12/06/18)

Introduction

In April 2018, Seattle Mayor Jenny Durkan announced short- and long-term actions to address climate change, including analysis of a possible strategy to reduce both greenhouse gas (GHG) emissions and auto congestion through road pricing. This strategy—often referred to as congestion pricing—could also generate revenue to support investment in increased transit service, electrification (e.g., electric vehicle charging stations, electric transit vehicles) in historically underserved communities, as well as other transportation-related needs.

In addition to evaluating the high-level feasibility and impacts and benefits of various pricing tools, the Seattle Department of Transportation (SDOT) is exploring effective messaging and communications strategies to help the public and other key stakeholders understand what congestion pricing is (and is not), how the city is approaching policy research and development, and how the public can be engaged in this process. In this context, communications and messaging strategies should:

- Engage the public in developing a congestion pricing approach that is fair and equitable;
- Articulate the problem(s) that congestion pricing may help solve; and
- Communicate the benefits of congestion pricing, including how revenue might be used.

This paper provides context for the City of Seattle as it begins exploring congestion pricing options, including lessons learned from other cities around the world and best practices in public engagement. It includes the following sections:

- Summary of congestion pricing in other cities
- Overview of best practices in public engagement, messaging, and communications
- Possible approach to messaging and communications for congestion pricing in Seattle
- Recommendations and next steps

Because communications and messaging is deeply connected to social, cultural, economic and political contexts, best practices and lessons learned from other cities should be considered illustrative but not definitive.

Summary of Congestion Pricing in Other Cities

Congestion pricing has been studied, proposed, or implemented in cities across the globe. Select cities referenced in this paper are included in the table below.

Figure 1 Congestion Pricing Peers

City	Name	Description and Notes
Singapore	Electronic Road Pricing (implemented)	• Cordon pricing implemented in 1998 • Congestion pricing has been a major component of traffic management and emissions reduction plans since 1975
London	Central London Congestion Charge (implemented)	• Area pricing implemented in 2003 • Prior to adoption, funding for public transport was unreliable and congestion levels in central London were extremely high
Stockholm	Congestion Tax (implemented); called "Environmental Charges" during pilot period only	• Cordon pricing approach; policy had been considered for 30 years prior to pilot • Six-month pilot began in 2006 and was made permanent in 2007 following a referendum
Vancouver	Mobility Pricing (proposed); also referred to as "Decongestion Pricing"	• Two concepts are under consideration: 1. Regional congestion point charge with charge points at or near some—or all—regionally important crossings, complemented by further point charges at locations within the Burrard Peninsula 2. Varying distance-based charges throughout Metro Vancouver • Independent Commission gathered and incorporated feedback independently of government decision-making agencies to inform recommendations • Preliminary recommendations provided by the Mobility Pricing Independent Commission in May 2018
New York City	Congestion Pricing (proposed)	• New York was the first U.S. city to propose charging all motorists for driving in its congested core • Mayor Bloomberg's plan proposes a phased approach: - Phase One: Investing in transit connections between the central business district (CBD) and outer boroughs and suburbs; - Phase Two: Placing a surcharge on taxi and for-hire vehicle trips in the CBD; and - Phase Three: Implementing a zone pricing program for trucks followed by all vehicles entering Manhattan's CBD below 60th Street.

Overview of Best Practices in Public Engagement, Messaging, and Communications

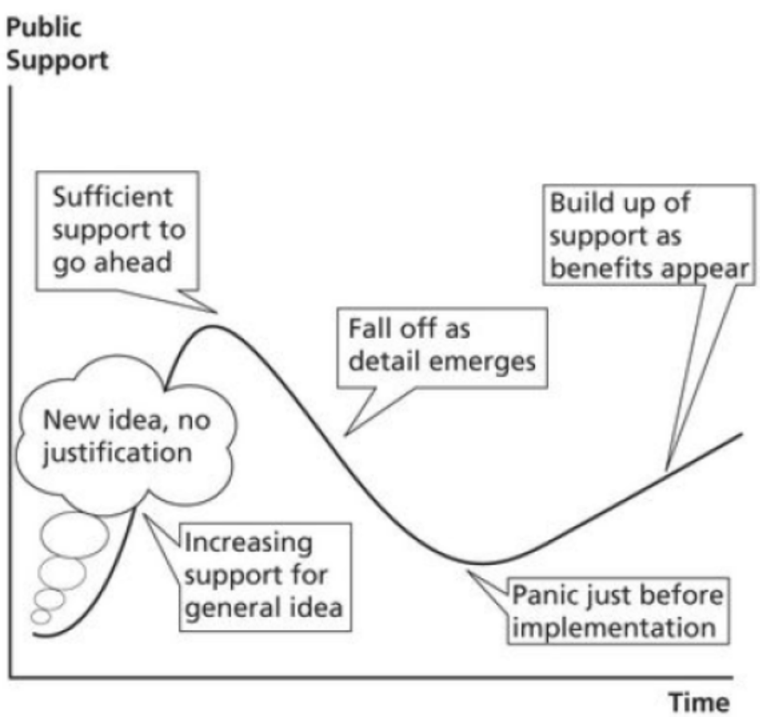
Public Perception of Congestion Pricing

Stockholm, London, and Singapore have all successfully implemented congestion pricing programs. While each city has unique engagement challenges, Stockholm's implementation demonstrated that once the idea of congestion pricing was introduced, explained, and tested (through a limited trial period), a fairly large segment of the population supported it.

Once a detailed proposal is established—but before full implementation—public support generally decreases. There may be several reasons for this. For example, the disadvantages of pricing may suddenly become more evident than the potential advantages, or fears may develop that the technical system will be overly expensive or fail to work. Figure 2 illustrates the curve of public support for road pricing, inspired by a similar experience of public perception during London's congestion pricing implementation.

This phenomenon is sometimes summarized as "acceptability decreases with detail." Once the pricing system is in place, however, support generally increases. There are two possible explanations for this: (1) the system works and people are happy with the benefits, or (2) their initial fears are not realized. This is often described as "familiarity breeds acceptability."[1]

Figure 2 Gestation Process for Road Pricing (reproduced from Goodwin, 2006)



[1] Centre for Transport Studies: Stockholm. 2014. The Stockholm congestion charges: an overview. <http://www.transportportal.se/swopec/cts2014-7.pdf>

Levels of Engagement

In any public process, there is a spectrum of opportunities to engage core audiences and use their input to shape the overall outcome of a proposed policy. Figure 3 illustrates these levels of engagement as described by the International Association of Public Participation (IAP2).

At the outset of any policy that has a public impact or benefit, policy developers should outline the key opportunities for engagement throughout the process and articulate how those opportunities can influence the process.

Figure 3 IAP2 Spectrum of Participation (International Association for Public Participation, 2004)

INCREASING IMPACT ON THE DECISION

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision. We will seek your feedback on drafts and proposals.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will work together with you to formulate solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

Messaging and Communications Themes

Based on best practices in public involvement and communications and an understanding of the ebb and flow of public perception, the following messaging and communications themes should be applied in developing a congestion pricing policy.

Goal- and Solution-Driven Messaging

In developing messages that are both goal and solution-driven, agencies should:

- Identify a focused set of goals that a congestion pricing program will achieve (i.e., what is the problem pricing will solve) and use these goals as the messaging focus throughout exploration, policy-making, and implementation; and
- Ensure that key messages are developed with transparency to foster trust and encourage public engagement.

Congestion pricing programs are most often motivated by the goal to reduce traffic congestion in a central business district. In some cities, this message is framed around improving air quality and reducing GHG emissions. Often, pricing programs are messaged as a response to the problem

of congested roadways and increased travel times. Singapore, London, and Stockholm all successfully implemented congestion pricing with the explicit goal of traffic management.

Stockholm and London both established clear messaging around goals and objectives early in their processes. Though public support varied throughout the policy-making phase, high-level messaging and communications around specific goals was consistent, and in Stockholm, public support ultimately skyrocketed after implementation of a pilot program.

Vancouver used the messages and graphic shown in Figure 4 to clearly and concisely articulate its goals. Note that these messages were focused on how mobility pricing (Vancouver's nomenclature) is solution-oriented.

Figure 4 Vancouver Mobility Pricing Goals

Understanding Audiences and Stakeholders

As a core principle of developing any communications or messaging plan, understanding audiences and stakeholders is critically important in the early phases. Shortly after developing strong goals and messages agencies should:

- Engage a variety of audiences early and regularly, especially potential supporters and skeptics and populations that may be adversely affected (or have a perception of adverse effect) by a proposed policy;
- Develop partnerships with organizations from a variety of stakeholder groups;
- Conduct outreach to different geographies, especially outside the urban core; and
- Develop and grow awareness of the program with trusted spokespeople and thought leaders from a variety of organizations and perspectives.

Equity is an important component of exploring congestion pricing proposals and how potential polices are communicated and approached. Vancouver incorporated equity metrics in their mobility pricing proposal, noting that discussions of equity demanded they start with clear objectives and specific strategies for how pricing-generated revenue would be used.[2]

[2] City of Vancouver. August 2018. Workshop presentation.

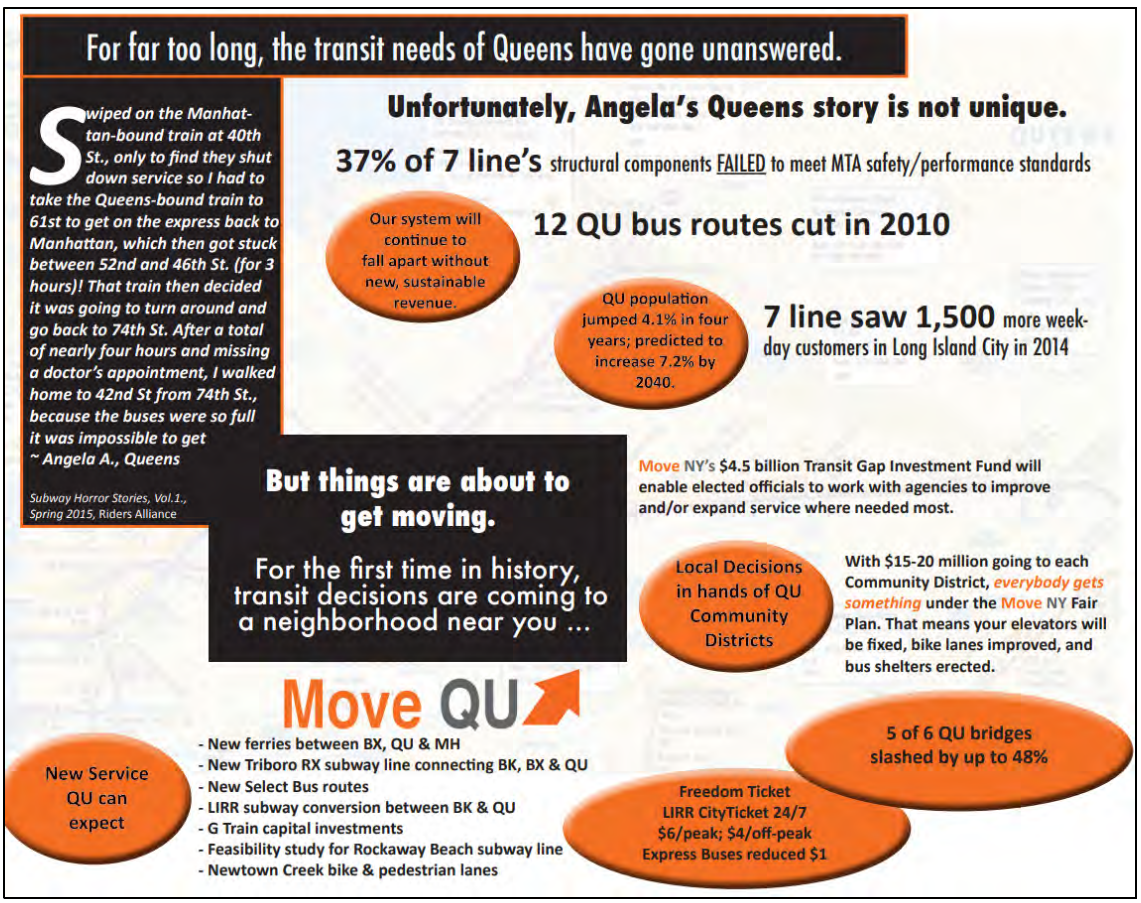
Ensuring engagement with all audiences—especially potentially disproportionately affected audiences—means that any public engagement approach must lead with equity. (See the Draft Pricing and Equity White Paper for specific recommendations about equitable engagement.)

Messaging to different market segments should seek and incorporate feedback—especially issues and concerns—from many stakeholder groups. One possible process for engaging different market segments in congestion pricing messaging suggests that the lead agency should:

- Anticipate the issues and concerns of different groups
- Meet with stakeholder groups proactively to gather and incorporate direct feedback; actively seek out and engage skeptics and critics
- Address issues and concerns in developing a potential congestion pricing policy
- Communicate how feedback from stakeholders is incorporated

Tailored messages should focus on demonstrating an understanding of each group's concerns, what options they have, and how they will experience potential benefits. Figure 5 shows pro-pricing advocacy group MoveNY's factsheet, which lists benefits that the outer borough of Queens could expect from a congestion pricing program.

Figure 5 MoveNY Queens Benefits Factsheet



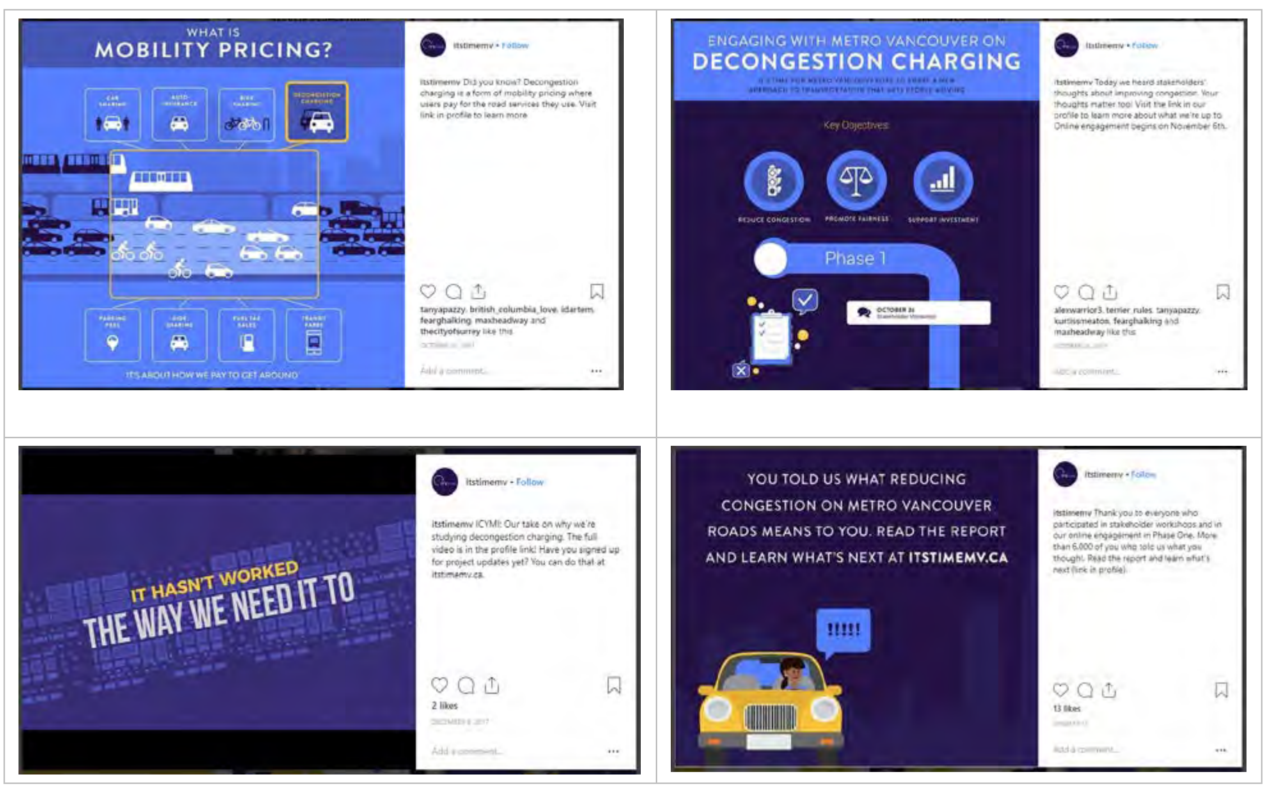
Clear Communications and Materials

Following development of clear goals, strong and consistent messaging, and an understanding of audiences and stakeholders, the next step in effective communications is to develop collateral that supports the goals and messaging, is tailored to specific audiences, and reflects the stage of policy development. This information should respond to the needs of key audiences and be developed in easy-to-understand language and formats that clearly articulate core messages. Principles for effective communications materials include:

- Ensure communications and materials use consistent, top-line messages throughout the life of the project
- Use traditional media sources (e.g., television, radio, newspapers) to reach the broader public to tell the story and illustrate the purpose and need of a potential policy
- Leverage social media, including through project partners, to seek input and feedback and to grow awareness among broad segments of the population

Tools and media to reach people are constantly and rapidly changing; therefore, the tools and strategies to deliver core messages will continue to evolve. In Vancouver's recent mobility pricing engagement process, they used social media and online platforms to gather feedback, as well as traditional public engagement methods including in-person open houses and workshops. Below are some examples of the types of visual messages and graphics included in Vancouver's "It's Time" campaign (implemented by Vancouver's Independent Mobility Pricing Commission) posted to the social media site Instagram.

Figure 6 "It's Time" Metro Vancouver Instagram Posts



Approach to Messaging and Communications

Messaging and communications should evolve throughout the development of a congestion pricing policy. Figure 7 shows the policy development process, from the problem definition and exploration stage through the implementation stage. Figure 8 illustrates the parallel processes specific to messaging and communications. As mentioned above, the problem statement or goals for congestion pricing should remain consistent throughout the development of the policy, while messages, communications, and engagement strategies should evolve and build upon previous stages. The following sections outline effective communication and stakeholder engagement steps for each stage of policy development.

Figure 7 Stages in Policy Development

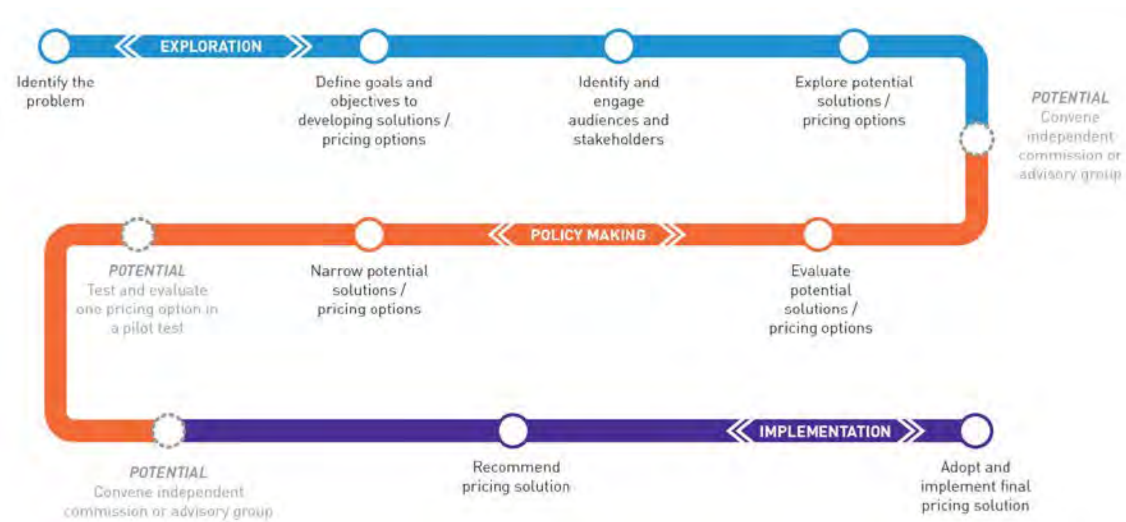
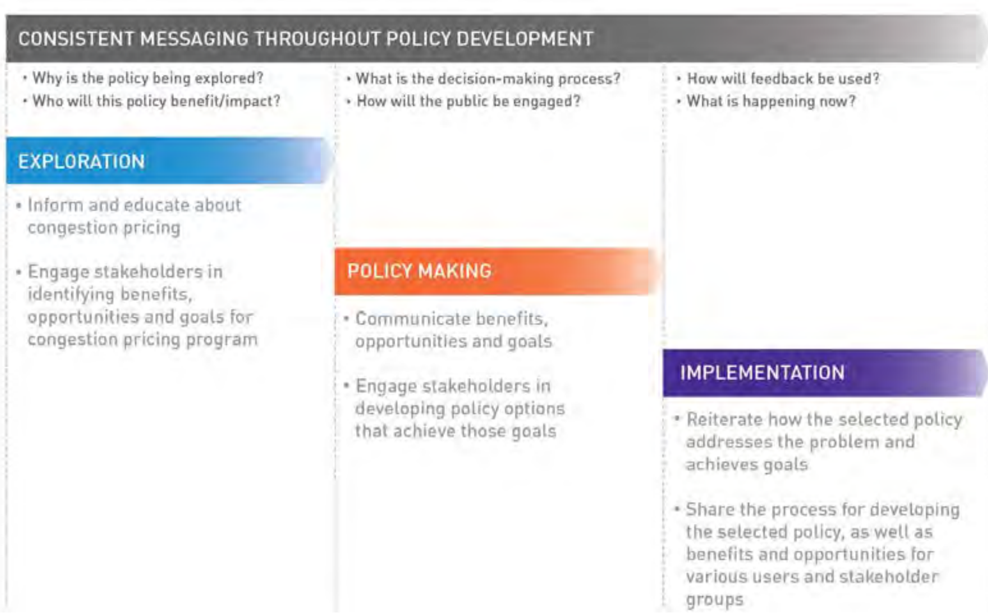


Figure 8 Communications and Messaging Milestones in Policy Development



Stage 1: Exploration

The exploration stage of policy development includes the following steps:

- Identify the problem
- Define the goals and objectives in order to find potential solutions to the problem
- Establish criteria—tied to the program goals and objectives—to evaluate the solutions
- Present an initial set of policy options for consideration

During this stage, core audiences and stakeholder groups should be identified and engaged in defining the goals and objectives. Because the goals and objectives will inform the criteria by which to evaluate potential pricing options, a range of stakeholders should be engaged and broad public feedback should be sought and incorporated. People should understand how they are being engaged and their opportunities for informing the policy options in order to build trust and allow for productive stakeholder and public engagement at later stages of the process. Appendix A lists possible market segmentation groups for engagement in Seattle's congestion pricing study.

Figure 9 summarizes the key messaging themes and communications strategies appropriate for the exploration stage.

Figure 9 Communications and Messaging Milestones: Exploration

LESSONS LEARNED: EXPLORATION STAGE ENGAGEMENT

New York's Stakeholder Skepticism and Limited Early Engagement to Outer Boroughs

New York City's initial pricing proposal was viewed as a tax, with no clear communication of specific benefits for different stakeholder groups.[3] Skeptics and stakeholders in outer, more auto-oriented boroughs were not engaged early in the process—many in these areas believed they would bear a disproportionate financial burden, relative to Manhattanites south of 86th Street. There was also little trust that revenue generated would be used to fund transportation improvements.

Sam Schwartz has stressed that engagement of the outer boroughs and known skeptics was especially important in the development of the MoveNY pricing program. The outer boroughs were strongly opposed to the initial proposal, but incorporating their concerns eventually led to a more equitable policy and the ability to message "what's in it for them."

Edinburgh's Mixed Messages and Weak Consensus about Congestion as a Problem

In Edinburgh, Scotland, there was only weak consensus that congestion was a big and present issue. Public messaging focused on congestion as a future problem. Edinburgh communicated a very large number of goals and objectives for implementing a congestion pricing plan, which confused the public. The city's congestion pricing plan ultimately lost public support, connecting back to the phenomenon that "acceptability decreases with detail."

Stage 2: Policy Making

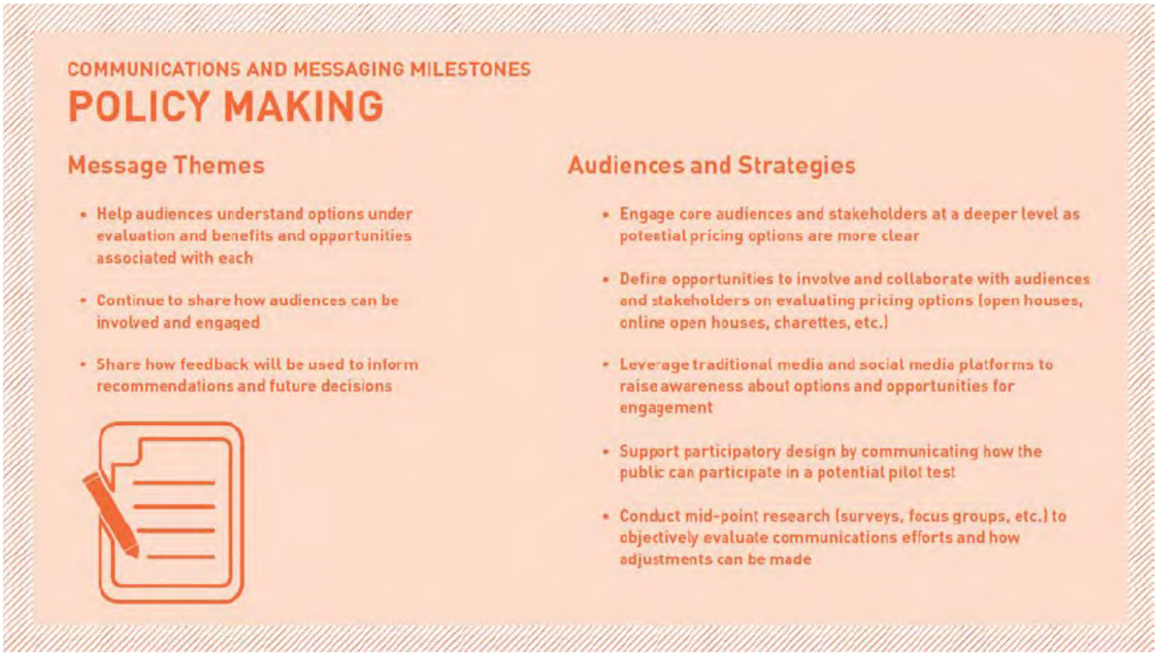
During the policy-making stage, potential options developed during exploration will be more fully evaluated and public feedback will be sought and incorporated. The following steps should occur at this stage of the process:

- Explore establishing an independent commission or similar body to act as the lead for this and future stages
- Evaluate solutions developed during the exploration stage
- Seek public feedback on those solutions and the evaluation
- Develop recommendations to final decision-makers
- Explore testing one potential congestion pricing policy through a pilot test

Figure 10 summarizes the key messaging themes and communications strategies appropriate for the policy-making stage.

3 Sam Schwartz. August 2018. Workshop presentation.

Figure 10 Communications and Messaging Milestones: Policy Making



LESSONS LEARNED: POLICY-MAKING STAGE

Vancouver's Independent Mobility Pricing Commission

Vancouver established a fully independent Mobility Pricing Commission to explore the pros and cons of congestion pricing (known as mobility pricing or decongestion pricing in Vancouver), to independently gather feedback and public input, and to provide recommendations to Vancouver's policy-making bodies.

Vancouver's engagement program was inclusive but rushed—it was executed without the time needed to properly educate the public and stakeholders on the purpose and principles behind congestion pricing and its associated confusing terms, particularly "mobility pricing" (how we pay for all mobility) and "decongestion charging" (paying for road use to manage congestion). Although it had many strengths, the use of an independent commission contributed to a failure to describe congestion pricing in the context of other transportation measures and improvements.

Washington Road Usage Charge Pilot Project

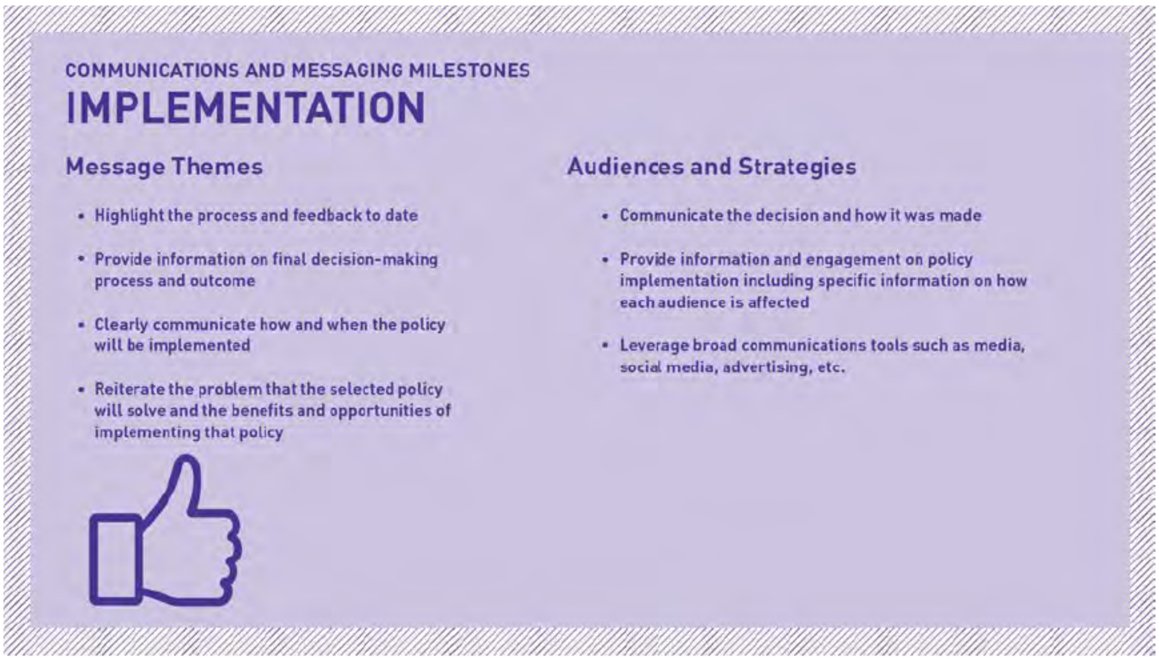
After over 10 years of policy exploration and examination, the Washington State Transportation Commission is currently conducting a pilot test of a potential statewide road usage charge to evaluate whether such a charge is a viable replacement for the state's gas tax. This pilot was launched during the policy-making stage and will inform state legislators during the implementation phase. While the pilot is still underway and final conclusions are not yet available, over 5,000 drivers across the state expressed interest in being part of the 2,000 driver participant pool, a much higher degree of interest than anticipated. This is an example of a highly participatory process that provides an opportunity for deep engagement and feedback in the development of a complex and controversial potential policy.

Stage 3: Implementation

The implementation stage follows the recommended pilot test and provides an opportunity to communicate lessons learned and program performance from the pilot. During this stage an independent commission or advisory body (if established) could recommend or select a pricing strategy for adoption and implementation by the decision-making authority (in this case, the City of Seattle). Once a system is implemented, travelers (not limited to drivers) need a strong understanding of how the system works, how much they are charged, and how to access other transportation options.

Figure summarizes the key messaging themes and communications strategies appropriate for the implementation stage.

Figure 11 Communications and Messaging Milestones: Implementation



LESSONS LEARNED: IMPLEMENTATION STAGE

London's Congestion Charge

London's Congestion Charge Zone (CCZ) was implemented and operational in early 2003. Although at times still controversial, it remains in place 15 years later and has significantly reduced congestion in central London. In 2007, Ken Livingstone, who was the mayor of London and champion of the CCZ, provided insights on why London's congestion charge was so successful. Livingstone cities five key factors, four of which include core principles of communications, messaging, and stakeholder engagement:

"Overall, the scheme is a success and has worked better than I hoped, with far fewer teething problems than I expected. Yet congestion charging has always been a controversial policy, and others thought it too risky to undertake. In order to implement the scheme it was necessary to:

1. Build and maintain sufficient public and stakeholder support for the scheme during its development and introduction;
2. Conduct meaningful consultations with a readiness to make changes to the scheme;

3. Provide additional public transport services to enable motorists wishing to switch to alternative choice of transport;
4. Provide widespread public information and specific traffic management measures on the inner ring road and also outside the zone to minimize potential problems at the scheme launch which could have undermined its credibility; and
5. Deliver the scheme quickly so that its benefits could accrue to London as soon as possible. The inevitable disruptions associated with implementation were offset by experience of benefits after implementation during my first term, giving Londoners the opportunity to express their views on the congestion charge at the ballot box."[4]

Stockholm's Pilot Introduction Leading to Implementation

Stockholm was successful in implementing a congestion pricing system by first implementing a pilot program. Prior to the pilot, public acceptance was very low. Through that pilot, stakeholders and the public experienced congestion pricing first hand, saw its value, and began to accept the system. Although often effective, a pilot project can be an expensive and high-risk strategy—pilots can have high associated costs, and public buy-in can falter with negative experiences during a pilot and/or the perception that their feedback has not been incorporated or reflected.

Recommendations and Next Steps for Seattle

This white paper presents a snapshot of best practices and lessons learned from a select group of cities that have explored or implemented a congestion pricing policy. This paper is not a comprehensive summary of the pros and cons of such policies as it related to communications and messaging, but offers considerations for the City of Seattle.

Suggested next steps for the City of Seattle are the following:

- **Define the key purpose and goals for congesting pricing and form a messaging and communications strategy around them.** This should be done as early as possible in the process, even if the full pricing strategy and policy is not yet developed. In the absence of strong messaging, stakeholders and the public form their own understanding and narratives, which can be challenging to reform or change. The purpose and goals form the foundation of long-term and consistent messaging used through the policy development.
- **Lead development of a full public engagement and communications strategy with equity.** In following the steps outlined above, it is important to ensure that in developing goals and messages and identifying audiences core questions about equitable engagement are asked, answered, and incorporated into plans and strategies (see Pricing and Equity White Paper for details and core questions to answer).
- **Tie congestion pricing messaging to citywide transit investments and improved travel alternatives.** This is a critical communications element, as it relates to creating an equitable system. *Seattle Transit Blog* has already charged that, "Without better transit, the congestion charge begins to look less like an attempt to help everyone get around faster, and more like a device to reserve street space for the wealthiest

[4] Livingstone, Ken. 2004. ***Journal of Planning Theory and Practice.*** The challenge of driving through change: Introducing congestion charging in central London.

drivers."[5] The City should be clear that pricing is only one part of an overall strategy—and it may be the part that makes other mobility improvements, like reallocating road space to bus lanes and cycle facilities, possible.

- **Ensure authentic opportunities for feedback, and demonstrate how feedback is incorporated.** Development of any controversial policy should include opportunities for feedback and input, and the communications and messaging should articulate how that input will be used to shape a potential system. Public input must be reflected in the system design to demonstrate a commitment to listening and valuing feedback. The City should consider leading a regional values conversation as a way to guide the study and establish program priorities. This would also help the City of Seattle develop messaging and terminology that reflects local values and concerns. A review of international road pricing schemes and technologies by D'Artagnan Consulting and the New Zealand Ministry of Transport supports this approach, noting that "a high-stakes policy like congestion pricing requires deep understanding of local geography and responsiveness to local conditions and concerns."
- **Explore the possibility of establishing an independent commission or advisory group to evaluate potential policy options.** In Vancouver, an independent commission was established to further explore policy options, seek and incorporate public feedback, and provide recommendations to the Mayors Council and TransLink Board of Directors. Fully independent commissions are not often used in the Puget Sound region, but advisory groups are frequently formed to help guide policy development for complex and controversial projects. If an independent commission or advisory group is established, it will be important to consider:
  - **Equity –** Ensure broad representation of stakeholders and audiences potentially impacted or benefitted
  - **Mission –** Ensure the group has an understanding of their mission and charge, and that the public also understands the role of the group
  - **Decision-making or recommendation authority –** Ensure that the group and external stakeholders fully understand and respect the recommendations or decisions made by the group to maintain trust in the policy-making process
- **Implement a pilot program to test the selected policy.** Given the sensitivity around road pricing, successful systems have mitigated risks by piloting a potential approach and moving incrementally through systematic policy adjustments.
- **Be prepared for support to decline as implementation approaches.** Plan the timing of implementation carefully to coincide with transit or other transport investments, election cycles, and other major events.

[5] Lawson, David. August 14, 2018. *Seattle Transit Blog*. Hearing about congestion pricing? Ask about transit investment. <https://seattletransitblog.com/2018/08/14/hearing-congestion-pricing-ask-transit-investment>

Appendix A: Market Segmentation

See attached Excel file, which warrants additional discussion with SDOT. When final, the file will become a table in this appendix with segmentation by stakeholder type.

Appendix B: References and Resources

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Seattle Department of Transportation

CONGESTION PRICING STUDY

DRAFT OPPORTUNITY STATEMENTS

Source: Oran Viriyincy

JANUARY 2019

Seattle Department of Transportation

DRAFT

SO WHY PRICING, AND WHY NOW?

WHAT?

Seattle is exploring congestion pricing as a way to help address traffic congestion and reduce greenhouse gas emissions.

WHY?

Traffic congestion is costing us. We spend more time commuting than most other cities our size, at a cost of $5 billion each year.[1] Our transportation system is the greatest contributor to greenhouse gas emissions—66% of emissions citywide come from transportation.[2]

HOW?

Our approach to developing and implementing a pricing program will be **equitable**, **transparent**, and **responsive**.

GROWTH

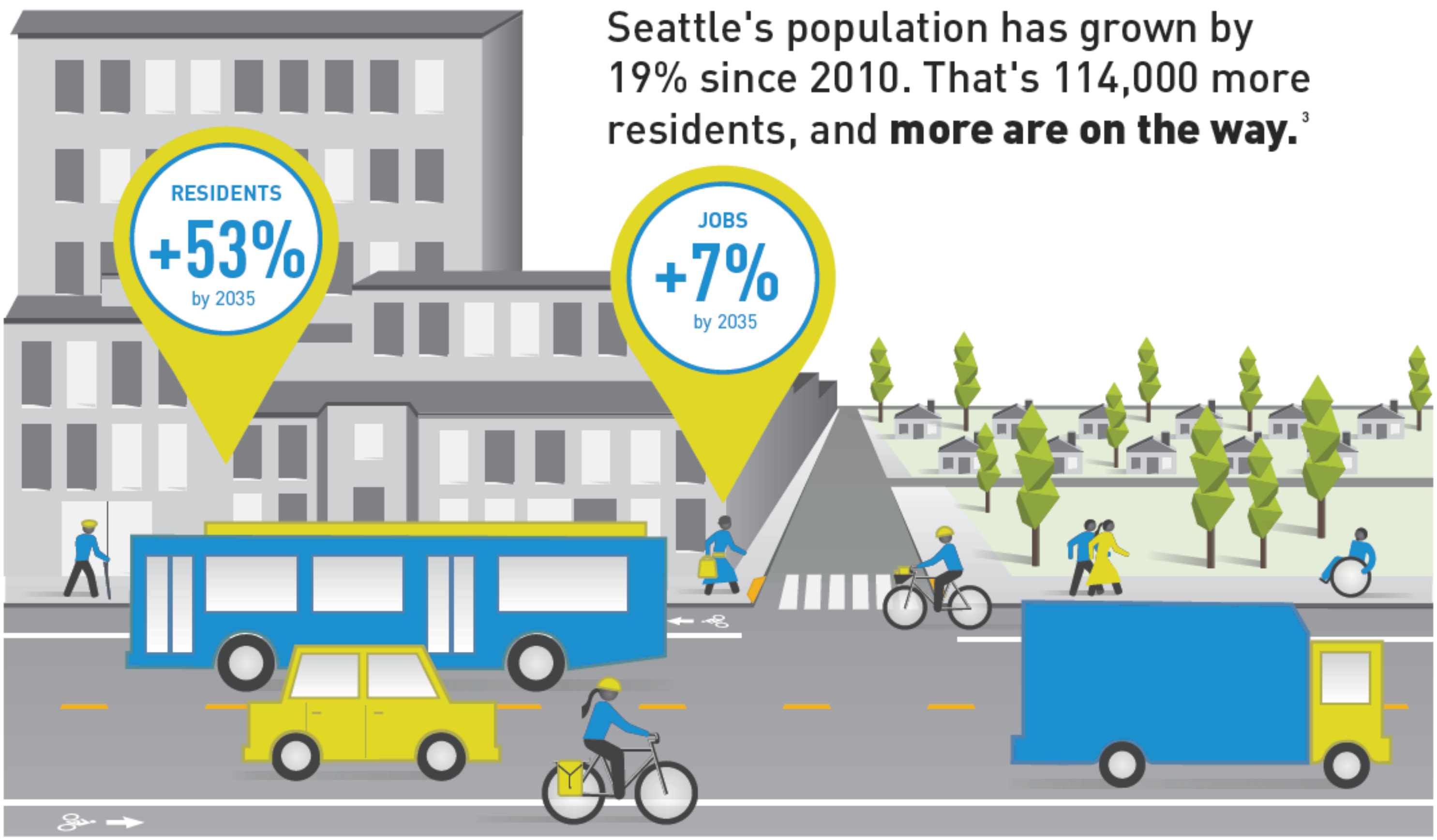
CHALLENGE

Seattle has ranked in the top four for growth among major U.S. cities for five years in a row. Growth isn't stopping, and there is no space in Center City to build new streets.

OPPORTUNITY

To move more people and goods in the same amount of street space, we can promote more efficient travel behaviors and expand travel options such as transit and shuttles.

Seattle's population has grown by 19% since 2010. That's 114,000 more residents, and **more are on the way.**[3]



EQUITY

With Seattle's growth comes pressures on housing and overall affordability. Some people are being priced out of the city and forced to move further from jobs and services.

CONGESTION

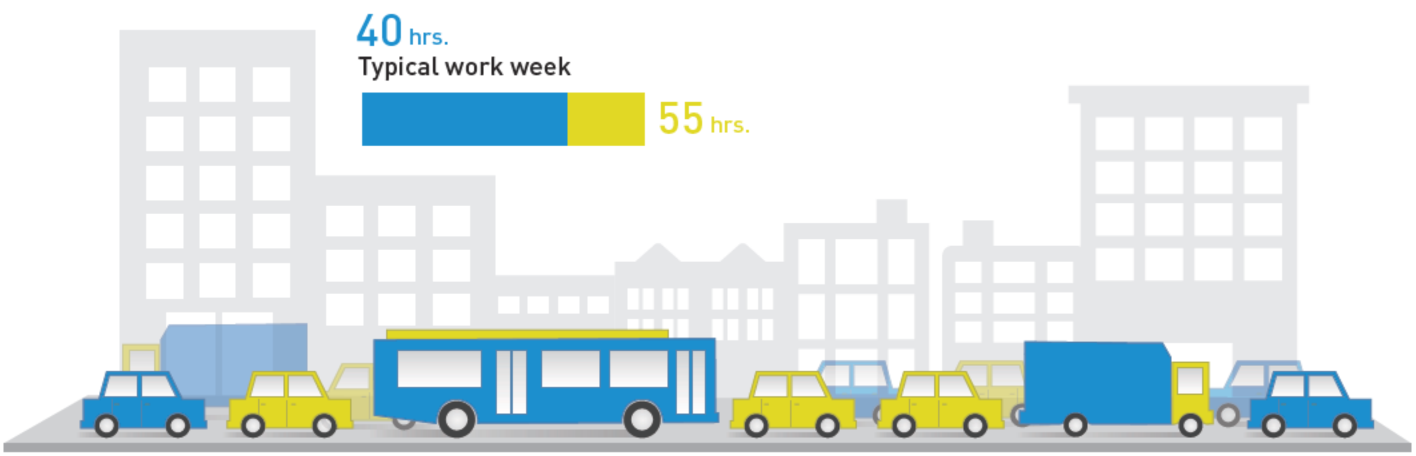
CHALLENGE

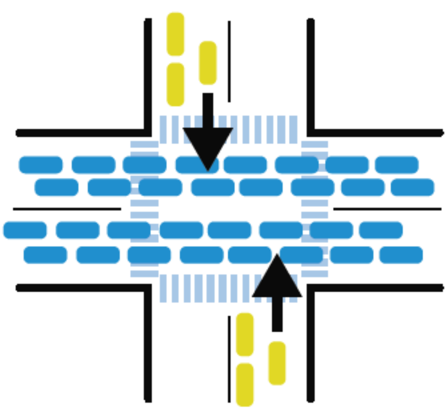
Seattle is ranked as the fourth most congested U.S. city.[4] With no space for new streets, we need to innovate or gridlock is going to get worse.

OPPORTUNITY

By lowering the share of people driving alone to and through Center City, and shifting trips to other times of day, we can free road space for other uses.

People and goods spend **55 hours per year** in traffic.[5]





Daily, there are 1,000 incidents of **"blocking the box"** and gridlocking at intersections.[6]

EQUITY

People that can't afford to live near their jobs or don't have access to transit often have no option except to drive when traffic is heaviest.

PRODUCTIVITY

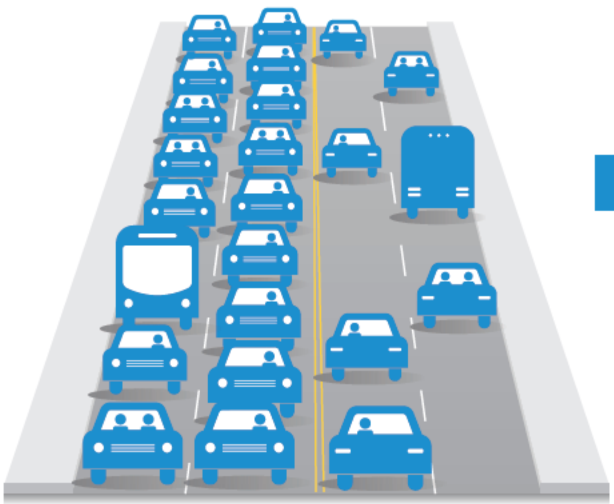
CHALLENGE

There is a significant economic cost associated with people and freight spending time stuck in traffic in Seattle.

OPPORTUNITY

Pricing is one tool that can help businesses prosper and ensure we get to the places we are going and to the people we love on time.

In 2017, the time spent in Seattle traffic is estimated to have cost **$5 billion in lost productivity.**[7] That is equivalent to **10 times Seattle's entire transportation budget** in 2018.[8]



$5 billion
in lost productivity

This equals
10x
SDOT's total budget and 5x the current bridge maintenance backlog

EQUITY

People with hourly wage jobs or more than one job experience disproportionate impacts from unreliable traffic patterns.

TRAVEL TIMES

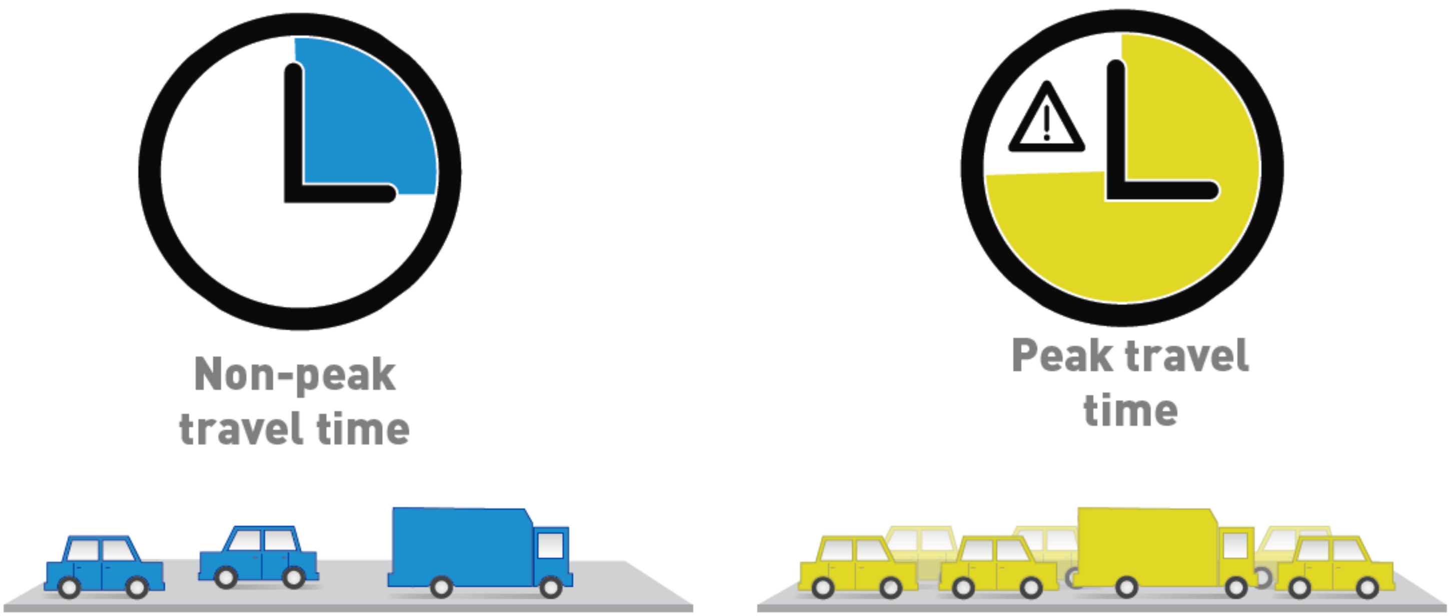
CHALLENGE

Overall travel times are increasing on most corridors in the Puget Sound region, particularly during the afternoon commute. This can slow the most efficient travel options that move more people, including the 37% of commuters on a bus.[9]

OPPORTUNITY

Traffic that flows more reliably helps to get people and goods where they need to go on time, any time of day. Trips can be faster for both drivers and people riding transit.

Average travel times to or through Seattle on I-5, the SR 520 bridge, and the I-90 bridge triple during the afternoon peak.[10]



EQUITY

Unpredictable travel times can compromise quality of life and job security, especially for people who work multiple jobs or who have fewer travel options.

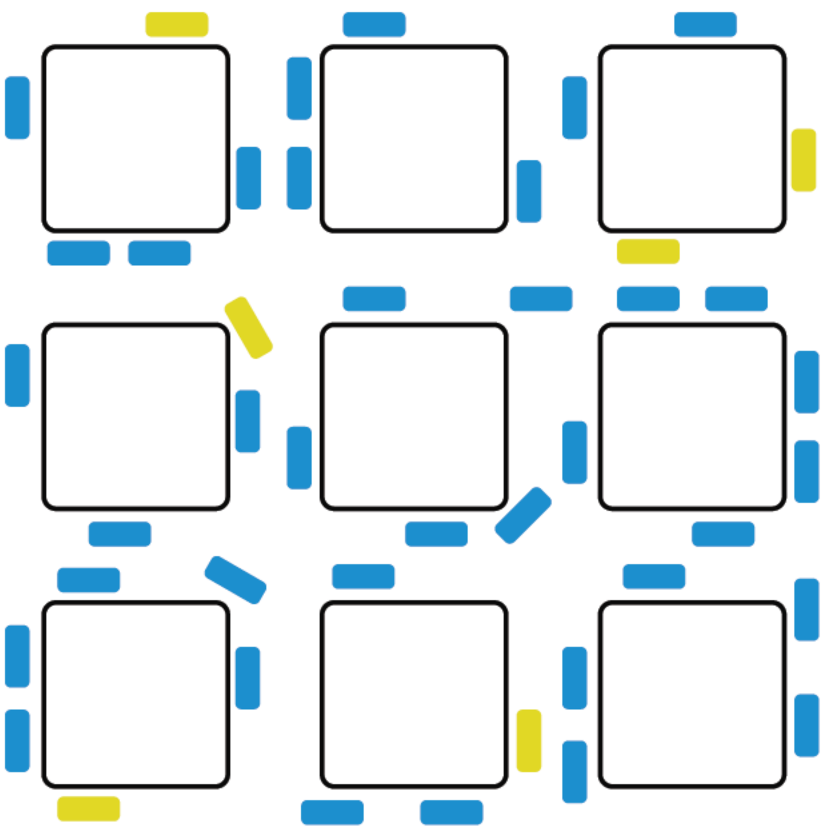
EMERGING TECHNOLOGIES

CHALLENGE

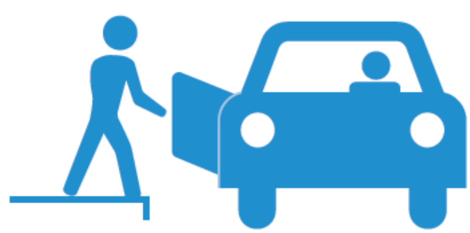
New technologies are changing how people and goods travel in Center City. Shared mobility options are growing, and autonomous vehicles (AVs) are on the horizon.

OPPORTUNITY

We can proactively manage street and curb space to avoid an influx of empty, circling cars, ensuring that modes moving the most people have priority, and are accessible to everyone.



Nearly 10% of circling traffic in Seattle is **ride-hailing vehicles** (Lyft, Uber, and taxis).[11]



EQUITY

New mobility services contribute to the congestion that some drivers have no option to avoid. These services are often inaccessible to people who don't have smartphones or bank accounts and those with limited English proficiency.

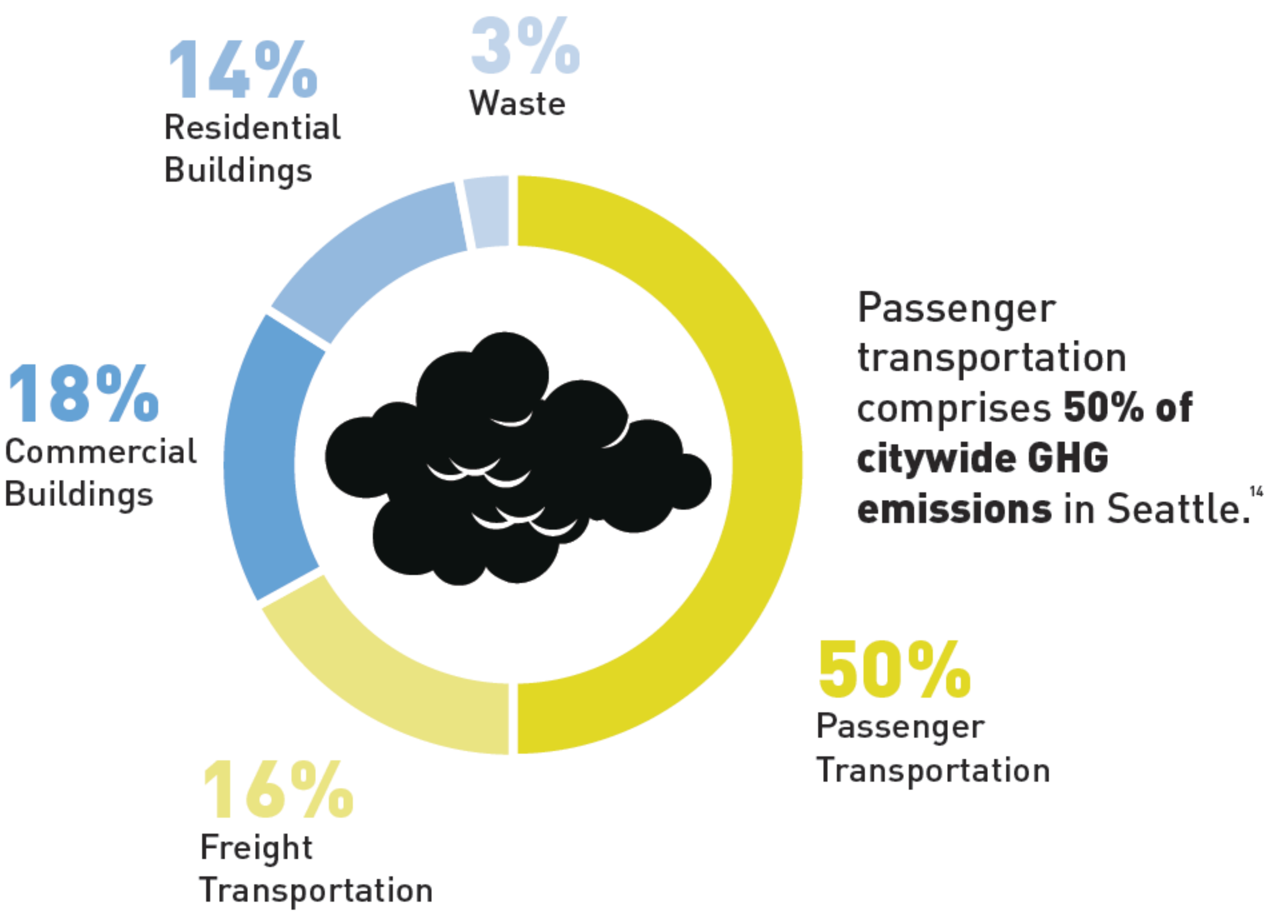
ENVIRONMENT

CHALLENGE

Seattle is among the top four cities in the U.S. with an increasing number of pollution spikes.[12] Road transportation remains the largest contributor to Seattle's greenhouse gas emissions.[13]

OPPORTUNITY

If we act now, we can curb emissions and reduce vehicle miles traveled to help Seattle meet its goal of becoming carbon neutral by 2050, and supporting the Paris Agreement's commitment to limit global warming to 1.5 degrees Celsius.



EQUITY

Seattle's worst air quality areas are also in communities of color, and King County households with annual incomes less than $15K experience rates of asthma nearly two times those of households with incomes above $50K.[15,16]

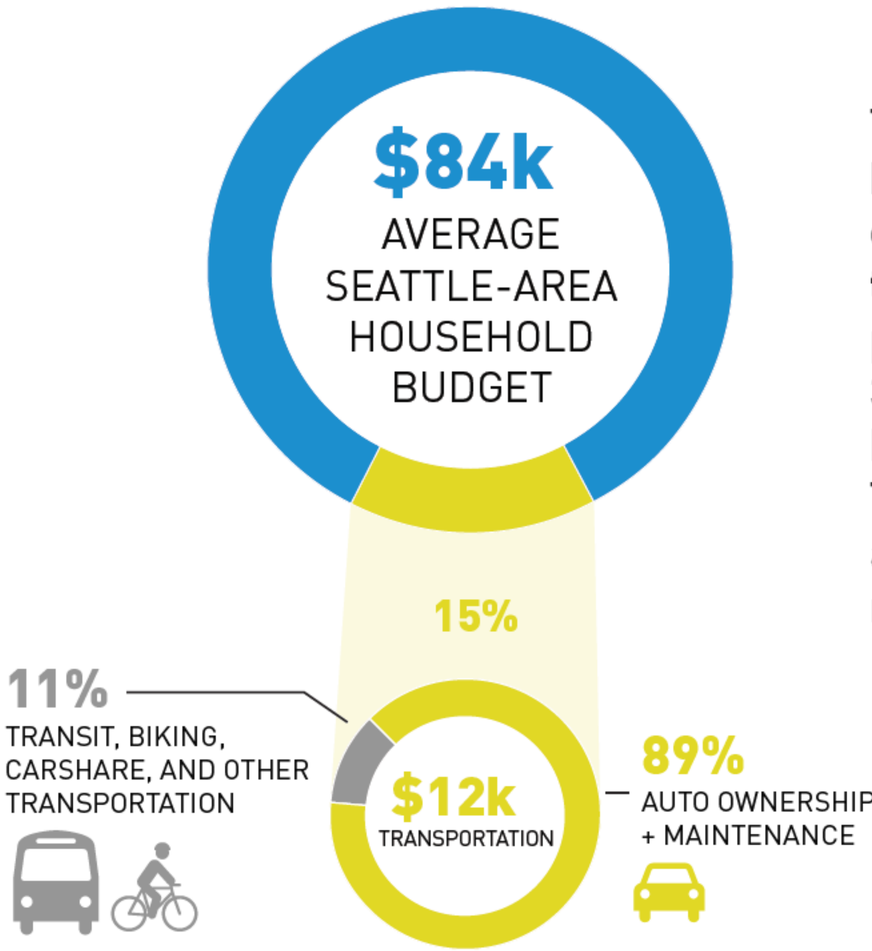
AFFORDABILITY

CHALLENGE

Our city is becoming increasingly unaffordable for many. The high cost of living has caused displacement, meaning more people are moving further from Center City jobs to find more affordable housing, and now face long, slow commutes.

OPPORTUNITY

With good travel options, car ownership can become a choice rather than a necessity. Investing in transit, street safety, and infrastructure that supports more efficient and sustainable travel options can reduce the amount of income people spend on transportation.



The average **Seattle household spends 15% of its budget on transportation**.[17] That percentage can be up to 30% for low income households.[18] Transportation is less of a financial burden for residents without cars.

EQUITY

Households with lower incomes spend a greater proportion of their budget on transportation, especially if they require a car.

HEALTH AND SAFETY

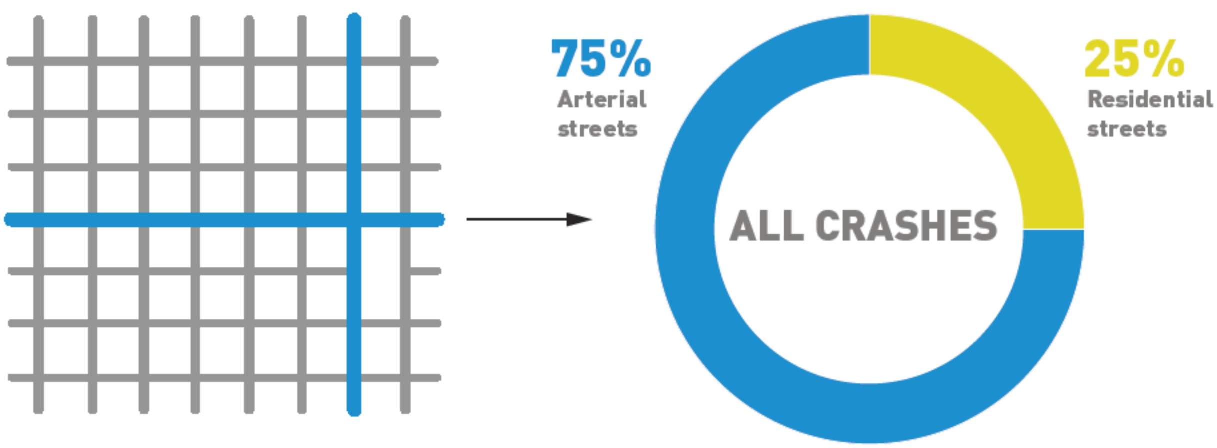
CHALLENGE

Congested streets contribute to air and noise pollution, stress, and traffic collisions. Crashes are more likely to occur when speeds vary along streets where high volumes of traffic—whether cars, bikes, people walking, or buses—merge.

OPPORTUNITY

Promoting more consistent travel speeds and making intersections safer in our busy corridors can help to reduce conflicts and improve safety for growing numbers of people.

3 out of 4 crashes in Seattle occur on arterial streets where traffic volumes are often highest. Center City is also where most pedestrian and bicycle crashes take place, in part due to greater exposure of people walking and biking.[19, 20]



1/3 of Seattle streets are arterials; our primary transportation corridors

3/4 of crashes take place on arterial streets

EQUITY

Congested streets put vulnerable travelers at a greater risk of collision and injury. People of color, older adults, and people who earn lower incomes are disproportionately represented in walking and biking fatalities.[21]

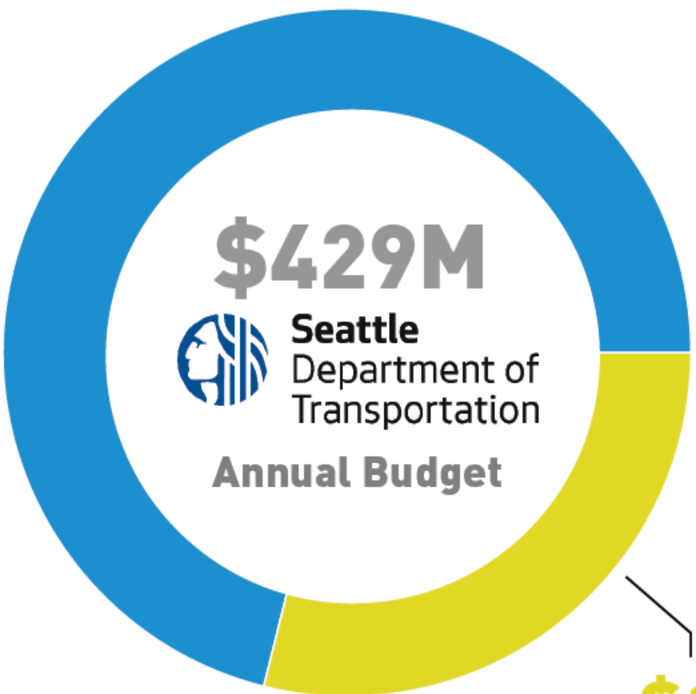
INFRASTRUCTURE

CHALLENGE

Seattle's streets, highways, and bridges struggle to accommodate our growing traffic, adding wear-and-tear to aging infrastructure.

OPPORTUNITY

Keeping our transportation system in a state of good repair will help Seattle stay affordable by lowering the cost of future maintenance. Allocating resources to support infrastructure for efficient and affordable travel options—especially transit—will create a more equitable and sustainable Seattle.



In 2015, approximately 29% of the department's budget was devoted to maintenance of existing infrastructure. Transit and HOV capital and operations cost approximately $26M, just 6% of the total budget.[22]

EQUITY

Sales and property taxes to pay for streets and roadways disproportionately burden people with lower incomes.[23]

CONCLUSION

A well-desigined pricing program can help to support equitable, efficient, and affordable travel and improve our quality of life.

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Seattle Department of Transportation

01.2019

Seattle Congestion Pricing Study

Pricing and Equity White Paper

January 2, 2019 Draft

Draft for Internal Review Only

Our communities. Our transportation. Our future.

Overview

Transportation has reinforced inequality

America's transportation investments and policies have helped to create—and reinforce—racial and social inequities. Since the 1950s, the emphasis on moving cars quickly, combined with sprawling land use patterns, has come at high price. The combination of a lack of infrastructure for walking and bicycling and inadequate public transportation has limited access to opportunities.[1] A Harvard study found that such access (measured as commuting time) was the *single strongest factor* behind whether people can escape poverty.[2] For members of marginalized communities ~~that~~ who do own vehicles, transportation can consume over 30% of their annual income.

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Transportation investments have not only favored those with the resources to own, operate, maintain, and safely store (park) a motor vehicle; they have often funded ~~gone toward~~ roads that cut through ~~or run adjacent to~~ lower-income and minority neighborhoods, those without the political power to effectively push roads elsewhere. As a result, low-income and minority communities have borne the brunt of air quality impacts~~,~~ with elevated rates of ~~asthma and other~~ chronic illnesses triggered by air pollution.[3] King County households with annual incomes less than $35,000, for example, experience the highest rates of asthma—over 60% higher than those with incomes above $50,000.[4]

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Transportation is also responsible for an astonishing 64% of greenhouse gas emissions in the city.[5] The same vulnerable communities that are impacted by historic inequities ~~have~~face disproportionate risks f~~e~~rom climate change. For example, people with disabilities may have difficulty evacuating during emergencies, and older residents have higher risk for pre-existing health conditions.~~, and outdoor~~

Commented [SJ2]: ...historic social and economic inequities....

~~Can we add local data or examples here to the paragraph above?~~
If we are to successfully move beyond a car-centric system that marginalizes communities of color and lower incomes, we need policies that are both equitable and redress historic disenfranchisement.

Seattle is exploring new transportation solutions

Seattle faces many of the same transportation challenges as cities across the country. ~~Transportation is by far the largest source of greenhouse gas emissions in the city.~~ W~~Meanwhile, w~~orsening traffic congestion has lengthened commutes for drivers while slowing down buses and increasing the cost of operating public transit. Programs to speed buses through low-cost improvements like those on the Rapid Ride E Line can help. ~~-~~Business Access and Transit lanes and transit signal priority at 20 intersections have shaved around 8 minutes

off a ½-hour trip. Yet trips on transit still take too long for most people. Incomplete networks for people walking and bicycling deter the most affordable and often most efficient forms of transportation.

~~Can we add local data or examples to the paragraph above?~~

With SR 99 set to begin tolling in 2019, potentially diverting more traffic to city surface streets, the City of Seattle is starting to explore whether congestion pricing may help achieve a variety of City goals. In its initial phase of exploration the study will look at different forms of pricing, such as charging a fee when a vehicle crosses into a zone that experiences intense congestion (known as *cordon pricing*, this approach is relatively new and has only been applied to downtowns in several international cities). Other forms of pricing may be more targeted to specific types of vehicles, for example, charging ride-hailing fleets or commercial vehicles within a specific area.

By internalizing the true costs of driving and generating revenue that funds alternative modes of transportation, congestion pricing can be one piece of a more equitable transportation system. However, without a clear process for incorporating community voices and supporting more affordable, accessible, and healthy transportation options, pricing may exacerbate inequality. As with so many issues, the design and implementation will determine the equity impacts. The devil is in the details.

Prioritizing equity as part of congestion pricing

The Seattle Department of Transportation (SDOT) prioritizes racial and social equity. The department established an Equity Program in 2017 to:

- Provide safe, environmentally sustainable, accessible, and affordable transportation options.
- Support disproportionately cost-burdened communities in Seattle to thrive in place.
- Mitigate the effects of displacement, including racial disparities related to displacement.

SDOT is committed to prioritizing affordable transportation options and defining broader transportation equity goals and strategies in partnership with community members and other stakeholders. This commitment is especially vital for major proposals like congestion pricing.

This equity white paper is designed to help frame some of the most important equity issues in this first phase of study. It is meant to help SDOT ask and answer the right questions around equity. It should also be useful for community members who are engaging in these conversations for the first time.

The white paper has the following sections:

- Overview

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- Pricing: How can pricing advance racial and social justice?
- ~~Six~~ Five Key Steps in Pricing: Building equitable outcomes into pricing programs
    - ~~Step~~ 1: Identify Who, What, and Where
    - ~~Step~~ 2: ~~Define~~ Choose Equity Outcomes and Performance Indicators
    - 3: ~~s~~ Determine Benefits and Burdens
    - 4: Devise Programs to Advance Transportation Equity
    - 5: Provide Accountable Feedback and Evaluation
- ~~Steps 3-6~~
- General Equity Impacts of Different Pricing Strategies

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This first phase of Seattle's congestion pricing study correlates with steps 1 and 2. The second phase is expected to start by mid-2019 and will cover steps 3, 4 and ~~–~~5.

Additional Resources

For those who would like to dive even more deeply into issues of pricing and equity, an excellent guidebook and toolbox for planners who are leading these planning processes was ~~put~~ released ~~out~~ by the National Cooperative Highway Research Program (NCHRP), *Assessing the Environmental Justice Effects of Toll Implementation or Rate Changes.* At well over 400 pages, it is likely overly technical for people who don't typically conduct detailed planning studies. Yet it has many excellent examples of where a particular tool, analysis, or strategy has been used to help advance equity. The most relevant sections are referenced at the ends of steps 1 and 2 below. We encourage equity advocates who dive deep into planning to reference this guide.

The City of Seattle's Racial Equity Toolkit has served as an important reference in developing this 5-step framework.

~~Are there a couple of highlights from the NCHRP work we should include here?~~

Pricing

How can pricing advance racial and social justice?

Congestion pricing is based on the idea that traffic congestion~~ and excess driving comes~~ comes with ~~some very~~ high costs to society and to individuals~~-~~ in the form of ~~—~~air and climate pollution, traffic collisions, and slower commutes for everyone. When tolls are charged—especially when based on demand so that the more congested a road becomes, the higher the fee to use it—some people make changes to some of their trips. To avoid tolls, they may choose to drive during off-peak times, shift to carpools or transit, combine trips, or even choose a different destination.[6] Those who pay enjoy a faster trip with less congestion. Even a relatively small reduction in the number of vehicles on the road can significantly reduce delays for everyone.

Cities such as London, Stockholm, Singapore, and Milan have implemented cordon or area pricing for their downtowns while greatly expanding their public transit networks, typically reducing driving (vehicle miles traveled) by 15-20% and congestion by 30% or more. In addition to Seattle, other North American cities including Vancouver, San Francisco, and New York are exploring congestion pricing.

There can be problems and unintended consequences with pricing. When implemented without a clear focus on social and racial equity, it can burden low-income people~~commuters~~ with new costs, just when skyrocketing housing costs are forcing many to move to the suburbs where driving is often the only ~~commute~~ option for most trips.

The chart below identifies some basic strategies that can address affordability and meet other important goals. A deep analysis of affordability for those who currently drive—as well as for people who use other modes~~ all commuters~~—will be an important part of the next phase of this study.

Seattle has a chance to design a program that truly prioritizes racial and social equity, but key questions remain: Can we harness the efficiency of congestion pricing to identify and implement strategies that are *also* equitable? Is it possible for disadvantaged and vulnerable communities, who currently suffer from inadequate access to opportunities (and for those that drive, high relative costs) to *benefit* from road pricing proposals? The section starting on page 14~~1~~ looks at the types of outcomes and indicators that can be used to evaluate whether the chosen strategies can combine to advance a racial and social equity agenda.

As part of future public engagement, there will be several opportunities to identify priority strategies that are on this list and specific ones that should be added. Some ~~of the~~ strategies may have been identified by the community in a recent transportation plan, but still need to be funded. Other strategies may look beyond ~~just~~ making transportation more affordable to also consider whether there are ways to stem displacement.

Sample strategies to advance an equity agenda

STRATEGY	EXAMPLES	ISSUES
Affordability and Driver Assistance	**Driver Discounts, Caps & Exemptions,** such as: • Free or discounted transponders • Toll discounts or ~~or~~ credits for low-income households • Exemptions for people with disabilities~~commuters~~ • No tolls during off-peak hours	If there are too many of these, then other components of the program, like increasing bus and carpool speeds or climate benefits, may be heavily impacted.
	Cash Payments (for those without credit cards or bank accounts)	Must be convenient to access and minimize up-front deposits.
	Transit Discounts • ORCA LIFT transit discounts • Subsidize bike and car share costs	
Greater Mobility Options and Safer Active Transportation Networks	**Improved Transit Service** • New routes to more destinations • Faster, more reliable service • Improved stations/stops	Must ensure routes serve vulnerable communities, ~~services~~ operate at beginning and end of shifts; minimize need to transfer; not impose undue time penalties; and get as close as possible to job sites.
	Carpool and Vanpool Programs • Carpool matching services such as Scoop • New vanpool routes • Additional park-and-ride lots	These may often be the most effective way to serve suburban and rural areas.
	Pedestrian/Bike Improvements • Improved ~~sidewalks~~pedestrian network • ~~Safe bike lanes~~Improved bicycle network • ~~Street lights~~Pedestrian-scale lighting~~Bike safety classes~~	Must be useful to enough people to qualify as an equity promotion measure.
	New Mobility Programs, such as: • Bike share • Car share • Creative use of Lyft/Uber or other services to connect to transit • Shuttles like Chariot • Carpool apps and programs	Even when affordable, access might be limited. Options should exist for people ~~Should have options for those~~ without smartphones.

Programs for Seniors and People with Disabilities	**Accessible Information** (senior help lines, materials)	Must be easy for seniors to access and plan trips.
	Targeted Transit/Shuttle Routes	Must serve destinations accessed frequently by seniors at the right times.
Healthier Communities	**Encourage Clean Air Vehicles** • Credits for drivers • Purchase clean transit vehicles	Transit should ~~emphasize~~ be prioritized on routes that pass through marginalized communities.

Five~~Six~~ Key Steps in Pricing Equitably

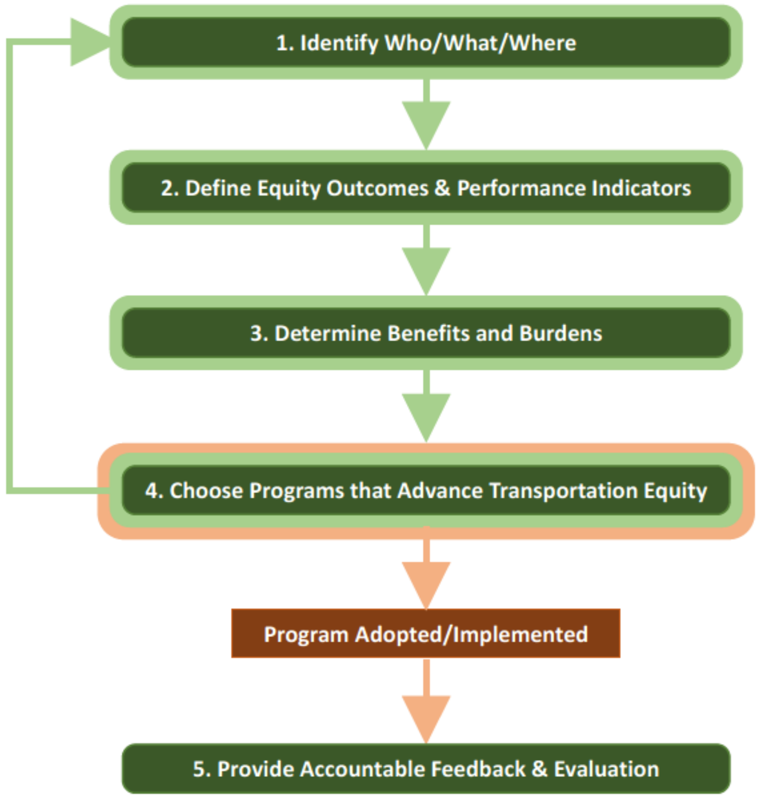
Building equitable outcomes into pricing programs

Separate from this Seattle-focused document, TransForm is developing a congestion pricing and equity toolkit that can be used by any organization considering pricing ~~that will be released by December 2018~~. Its focus is on supporting equity advocates and decision-makers in designing and implementing a pricing program that can advance a racial and social justice agenda.

The toolkit lays out five~~six~~ primary steps, from program design to implementation.

~~Six Key Steps in Pricing~~
~~1. Identify Who, What, and Where~~
~~2. Define Equity Outcomes and Performance Indicators~~
~~3. Determine Benefits and Burdens~~
~~4. Choose Programs that Advance Transportation Equity~~
~~5. Provide Accountable Feedback and Evaluation~~
~~6. Anticipate and Plan for Future Opportunities~~

This process, though, is not linear. The following graphic depicts the iterative nature of the process.



Once an initial set of actions is identified, these should be reviewed in light of the first set of steps in this Toolkit. Does the initial specification of who, what, and where need to be adjusted? Are the chosen indicators adequate to framing the impacts? What more might be needed? Are benefits and burdens properly distributed? What else needs to be addressed? What changes in program elements, or new elements, are suggested as a result of this analysis?

It is only after a set of iterations that the final pricing proposal may advance to the City Council for approval.

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The following pages of this white paper are intended as a primer to support strong participation and deep engagement from vulnerable communities. Each section includes some sample questions that can be asked at that stage in program development.

To align with Seattle's process, which is in its very earliest phase, this white paper focuses on the first two steps. It should be expected that the first several steps often ~~se steps often~~ overlap

and are iterative. When defining indicators in step 2, for example, it is important to understand what can actually be measured and how, which is a focus of step 3. ~~Iteration between steps is typical.~~

Needless to say, engagement and collaboration with a broad array of community stakeholders will be critical to producing equitable outcomes. In more traditional transportation projects, that engagement may be focused on the initial scoping to the time the final project is chosen. Congestion pricing, however, should be considered more of a dynamic tool than typical transportation infrastructure projects. Pricing projects are typically evaluated and modified at regular intervals. It is therefore important to plan for formal, continuous community engagement and collaboration *throughout* implementation, evaluation, and ongoing project monitoring and modifications.

PRICING EQUITY STEP #1

Identify Who, What, and Where

The earliest stages of a pricing equity study are where several key decisions are made, namely:

***Who*?** ~~Which~~ The populations that need to be considered from an equity perspective.
***What*?** The type and nature of pricing to be considered. Complementary strategies may also be discussed at a high level.
***Where*?** The geographic reach of the study.

In planning terms, this stage is where the study's *scope* is developed. Seattle is currently in the very initial part of Step #1. This first step ~~will be~~is the focus for the remainder of 2018 and early 2019. It will create a more detailed lens for future research, outreach, and program design.

Who: Populations to be studied

Any equity study is required to look at the impacts of major transportation projects on *minority* and *low-income* populations. Under Federal guidelines, *minority* populations include Black, Hispanic or Latino of any race, Asian American, American Indian and Alaskan Native, Native Hawaiian, and Other Pacific Islanders. It also includes individuals with limited English proficiency of any race. *Low-income* populations are any whose household incomes are at or below Federal poverty guidelines.

From an equity perspective, it is important to consider other vulnerable populations. Seattle's Transportation Equity program also focuses on people with disabilities, people experiencing homelessness, LGTBQ people, youth, and seniors.

Who else may be considered? Should the study look at barriers and issues specific to immigrants and refugees, local small businesses, and even services like non-profit meal delivery services? These are important questions during this initial scoping phase. Once a more comprehensive study is underway the community may identify additional focus populations.

QUESTIONS TO ASK:	
1.1	Are all populations adequately addressed in the study? *Should priority be given to certain populations? Why?*
1.2	Does the way groups are designated capture all relevant people? *For example, several studies from Seattle, King County, and Puget Sound Regional Council identify*

	vulnerable communities. Which of these should be a focus? How can we make sure to account for vulnerable residents who aren't in these areas of concern?
1.3	Are the criteria used to identify groups fair and accurate? *For example, does the measure of household income adequately capture the target population? In some metro areas, for example, households earning up to twice the Federal poverty level may still be economically disadvantaged and in need of more equitable policies.*

What: The proposal and viable alternatives

Seattle is starting with a wide view of ~~what~~ potential congestion pricing strategies to study. The initial list of tools that may be considered is shown in the table below. Cordon pricing around downtown has received the most attention in the media and it may be the most direct way to prevent a significant rise in traffic once SR 99 tolls are implemented.

Pricing Tools Summary	
PRICING TOOL:	***DESCRIPTION:***
Cordon Pricing	Charge vehicles crossing the boundary into a cordon pricing zone
Area Pricing	Charge vehicles crossing the boundary and driving inside an area pricing zone
Fleet Pricing	Apply targeted pricing to specific vehicle types entering a zone, such as ride-hailing fleets or commercial vehicles
Connected/Autonomous Vehicle (C/AV) Zone	Create a zone that allows only licensed connected/autonomous vehicles
Fossil Fuel Free Zone (FFFZ)	Create a zone that only allows licensed non-fossil fuel vehicles, such as all electric and hydrogen vehicles
Road User Charge (RUC)	Charge vehicles based on miles traveled
Arterial Toll Roads	Price entire arterial roads
Arterial Express Lanes	Convert some lanes on arterial roads to tolled lanes
On-Street Parking Pricing	Vary street parking prices to control demand
Off-Street Parking Pricing	Apply a fee/tax to off-street parking facilities

~~Point Pricing (e.g. bridges)~~

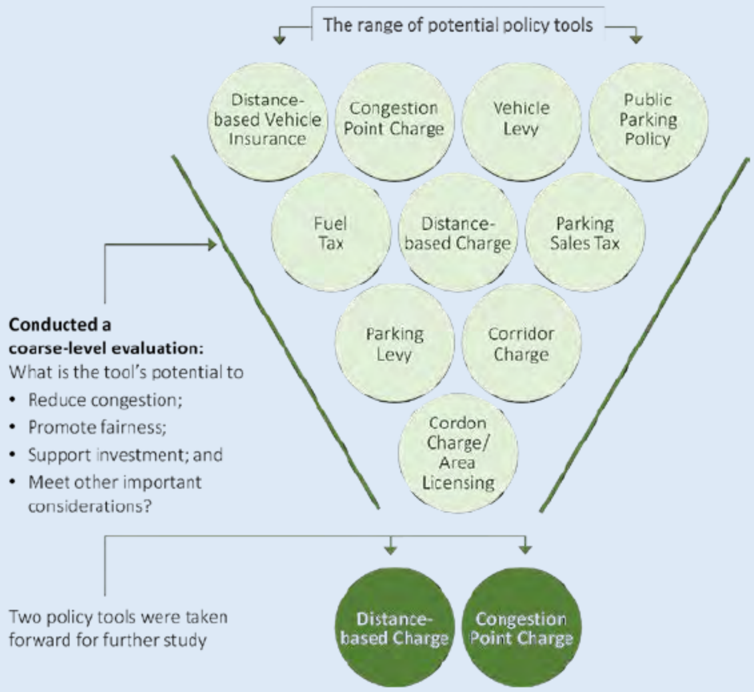
Commented [SC6]: This has been updated to match the Dec. 6 Tools paper from Patrick. His did not discuss point pricing (e g. bridges) so I did not add here.

During this first phase it will be necessary to narrow down the types of pricing that may be studied. This can be done by an initial screening of the impacts and benefits of the options above. The chosen options will then be subject, in 2019, to a more detailed analysis along the

lines of the Toolkit's step #3, *Determining benefits and burdens*. This is similar to the process Vancouver is employing, as described in the case study below.

CASE STUDY: Vancouver

Vancouver has mounting congestion, continued population growth, and two bridges that were tolled while others were not, leading some to drive extra distances to avoid the cost. While some type of bridge tolling or congestion charging seemed a likely outcome, Vancouver created an Independent Pricing Commission that studied a broad range of alternatives. They first adopted a set of transportation goals that included promoting fairness in transportation costs and impacts. They then evaluated which alternatives, if any, could best achieve their goals. After detailed analysis and community input, they settled on the two potential alternatives that seemed to be the best fit: distance-based charges and congestion point charges (similar in principle to cordon charges).



QUESTIONS TO ASK:	
1.4	Are there any additional pricing strategies that should be considered? *Put another way, does the list of project alternatives include all the options that best serve vulnerable communities? Have representatives of vulnerable communities provided input on measures, strategies and goals?*
1.5	Do the scope (and budget) of the planning study allow for a number of iterations so the equity strategies can be refined to best meet the goals and indicators~~Are the alternatives under consideration designed to maximize their potential effectiveness~~?
1.6	Have we identified community priorities from existing studies that may be relevant?

Commented [SK7]: Are there things besides effectiveness that should be maximized?

Where: The geographic reach of the study

Road pricing can affect people living and working far from the facilities being studied. It is important at an early stage to set the project boundaries so that vulnerable populations that may be impacted are within the study area.

This initial phase will describe the possible locations of the project relative to the existing transportation network, the location of vulnerable populations, and key destinations. In future phases of study, the question of geography can become even more fine-grained, looking at not just key employment centers but the location of health care, religious, educational, retail, recreational, and public service facilities and how vulnerable communities that use those may be helped with new mobility options or other tools to mitigate any increase in costs.

While it's not possible for a study to include *every* commuter or traveler—some might be passing through from distant cities, for example—it is desirable to include as many as possible~~the vast majority of those affected~~. The initial geographies are also important because they help to determine who should be the focus of the public engagement plan.

QUESTIONS TO ASK:	
1.7	Are all potentially impacted and vulnerable populations within the project study boundaries?
1.8	Do we know the other critical services that are regularly used by the relevant populations? Are these included within the study boundaries? *Examples of such services include shopping, medical care, education, religious, and recreation.*

ADDITIONAL RESOURCES

NCHRP's *Assessing the Environmental Justice Effects of Toll Implementation or Rate Changes: Guidebook and Toolbox* has a good introduction (pp. 9-18) to the eight kinds of road tolling or pricing actions that are typically considered the kinds of impacts these are most likely to generate, and the initial identification of environmental justice issues. The checklists on pp. 366-372 are also useful summations of the important points to be considered in framing an impact study. It does not deal directly though with cordon or area pricing.

In addition, Tool 1, "Developing a Socioeconomic Profile and Community Characteristics Inventory for Environmental Justice Assessments " explains how the census can be used, including the kind of metrics available and the data tables that report those variables.

Two other equity toolkits are also worthwhile for the insights they provide. The Race & Social Justice Initiative's *Racial Equity Toolkit* was developed to help implement the vision of the Seattle Race and Social Justice Initiative.[7] Likewise, the Greenlining Institute's *Mobility Equity Framework: How to Make Transportation Work for People* is a guide to creating a more community-centered transportation planning process.[8]

PRICING EQUITY STEP #2

Define Equity Outcomes and Performance Indicators

Another important early part of project planning is defining the primary goals, referred to here as *outcomes*. It is important to then match these outcomes with *indicators*—the measures that we will use to gauge success or failure, and how the program can be evaluated and improved. These more detailed performance indicators help us answer the core question: does this project advance equity?

There are dozens of papers describing different types of equity in relation to congestion pricing.[9] These include overall ideas of fairness, such as by geography, not just those related to vulnerable communities. This white paper recommends a focus on two types: *Process Equity* and *Outcome Equity*. ~~and *Process Equity*.~~

For *Process Equity*, the key measure is the full participation of vulnerable communities in planning, implementation, and project follow-up. Process Equity is central to the long-term task of making transportation systems more equitable for all peoples, addressing *historical inequities* that continue to affect vulnerable communities.

Outcome Equity focuses on the actual *impact* of the program. TransForm recommends consideration of at least three dimensions of Outcome Equity:

1. Affordability;
2. Access to opportunities; and
3. Community health.

~~The fourth dimension, *Process Equity*, is focused on the full, effective participation of marginalized communities in project scoping, planning, and implementation:~~

~~4. Full participation.~~

It is important to be clear on proposed outcomes as well as their relative priority, since some equity strategies (such as giving toll exemptions to different groups) may seemingly work against other project goals (such as reducing climate emissions and local air pollution).

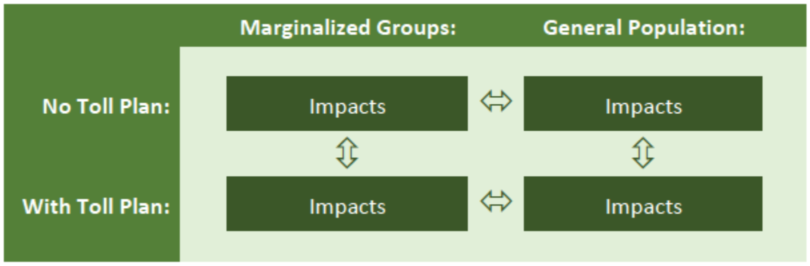
This section provides a short discussion of each of the four dimensions noted above. This is followed by a chart with some sample indicators for each dimension.

Note that most of these indicators—such as changes in transit ridership or the percent of toll revenue spent to benefit marginalized communities—can be predicted ahead of time using models and formulas. Later on, these indicators can also be used to monitor, evaluate, and improve the program. While the methods and data to evaluate some indicators are imperfect, expensive to collect, and often time consuming, they are an important focus.

It is often useful to do *comparative analysis* in order to determine the real impacts of proposed changes in the transportation system. At its simplest, two kinds of comparative analysis are useful: ones comparing impacts from the road pricing proposal with what may be expected if road pricing is *not* adopted, and one comparing the impacts on vulnerable populations with the impacts on the general population. These projections are often made for when the project is first implemented and for one or more time points in the future (such as in 10 years and 25 years).

The following chart depicts these comparative analyses, with arrows showing where the comparisons take place:[10]

Commented [SK8]: Can this show comparing multiple pricing plans? E.g. No, with plan A, with Plan B



In addition to these comparisons, the study will also compare different pricing strategies against each other. For example, Vancouver calculated how much low-income, medium-income and high-income households might spend on different kinds of congestion pricing. People in high income households generally drive more, so were projected to pay more as an absolute dollar figure, but low income households would pay a larger percentage of their income. They calculated that, in order to ensure everyone paid the same proportion of their income as the high income households would, around 20 percent of the net revenues (between CD $170-345 million) would need to be returned to low income households through rebates, discounts or other measures. This measure can be used to compare how equitable – or inequitable – different kinds of charging are in practice.
~~These aggregate or "big picture" analyses can help people understand what it would take to achieve certain goals. For example, Vancouver compared the proportion of funds expected to be collected from low-income households and all others. They found that for the congestion~~

~~pricing proposal *not* to be regressive would take an investment of CD $250 million in discounts and other measures targeting vulnerable populations.~~

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These comparative analyses can be useful in highlighting unfair advantages or burdens at the group or "population" level. But, ultimately, it is also important to understand the real impacts—both benefits and burdens—on *individuals* in certain communities. How much will it cost for an individual who has no option but to drive during the peak? Are reasonable alternatives like transit readily available and useful? What are the alternative routes or times of day~~,~~ that low-income travelers might use to avoid the extra costs, and how burdensome would the lost time or change in schedule be? Even if the number of such individuals is not large, the tolls may be a real burden for them with serious consequences.
~~These comparative analyses can be useful in highlighting unfair advantages at the group or "population" level. But ultimately, it is also important to understand the real impacts—both benefits and burdens—on *individuals* in certain communities. How much will it cost for an individual who has no option but to drive during the peak? Even if the number of such individuals is not large, the tolls may be a real burden for them.~~

Affordability

At the heart of the affordability question is: Will the proposed pricing project make transportation *more expensive* for some members of vulnerable communities? If so, by how much?

Given there will also be a stream of revenues that can be distributed, it is also important to ask if there are ways transportation can be made *more affordable.* Unlike sales taxes, fuel taxes, and many other transportation funding sources~~other regressive revenues~~, toll programs can offer means-based affordability options that give discounts, set caps (the maximum amount that someone might need to pay), provide rebates or fully exempt certain drivers.

It is also possible to provide lower-cost alternatives, for example, expanding the breadth of the ORCA Lift fare discount, or deepening the discount (from the current half-price for those who qualify based on income[11]). ORCA Opportunity, for example, already provides free, unlimited transit for high school students, income-qualified middle school students at Seattle Public Schools, and Seattle Promise Scholars.[12] Seattle is also starting a low-income car-share program to provide income-eligible residents with discounted car share memberships and driving minutes.[13] While these are currently funded through other sources, many of these equity programs—and new ones—could be funded through a congestion pricing plan.

Expanded and faster transit options may also allow some people to reduce their overall transportation costs by reducing ~~for a reduction in~~ private vehicle use or even ownership ~~for some~~. London added 300 buses to prepare for congestion pricing. Los Angeles started two rapid bus lines~~,~~ as part of their freeway Express lanes on I-10 and I-110, ~~started two rapid bus lines,~~

along with allocating 40% of ongoing net revenue to public transit improvements and 40% to bicycle and pedestrian safety.

Performance indicators should capture the impact and scale of ~~road~~ pricing on all households from marginalized communities—both drivers and non-drivers. An excellent study of highway tolls in the Puget Sound Region was conducted in 2011 and shows how considering the full population, and not just those expecting to pay tolls or fees, is the appropriate analysis and is in accord with standard best practice in distributional studies of taxes.[14]

Evaluation will also look at how ~~the~~ costs may vary by geography. The following table illustrates sample indicators ~~for assessing~~to assess impacts on affordability.

Affordability	
CATEGORY	***SAMPLE INDICATORS***
Discounts	• Discount level on tolls for low-income and other populations • Discounts on transit fares or other alternatives (subsidized by tolls)
Regressiveness	• Degree to which discounted tolls are regressive, and how much revenue redistribution is needed to make them progressive (or neutral, as was calculated by Vancouver) • Household budget spent on transportation, by income level (total amount and percentage of income) • Change in share of household income spent on transportation and housing, by income category
Participants	• Number of people from marginalized communities participating in (or eligible to participate in) discounted tolls or transit fares • Ratio of those who are eligible for the equity pricing programs (both for car drivers and for non-driving strategies like discounted transit) to those that have actually signed up
Subsidies	• Amount of toll revenue invested in transportation subsidies for marginalized communities (and as a share of total net revenue)
Savings	• Total expected savings from toll and other subsidy programs for marginalized communities
QUESTIONS TO ASK:	
2.1	How will congestion pricing change affect the travel costs of low-income drivers and non-drivers?
2.2	How do we ensure that members of vulnerable communities have ways to overcome financial barriers to participation, including for the unbanked and for those who may have trouble putting up deposits for transponders or other required technologies?

2.3	Do we have enough data on travel patterns and the potential changes in travel behavior to understand the potential financial impact of the tolls? *Would it be useful to complement that data with focus groups or surveys?*

Access to Opportunity

The purpose of the transportation system is to~~s~~ link people to all kinds of opportunities: jobs, education, health care, and social, recreational, and commercial activities~~events~~. ~~-~~So ~~Along with the question of affordability, is~~ the question of how a proposed pricing (or infrastructure) proposal may change *access* to these places is critical. A well-designed pricing strategy ~~program~~ should ~~be able to~~ increase access, especially for those that rely on public transit and drivers that find it worth the expense to use the priced~~tolled~~ facility or area.

There are two big areas of concern with regard to access. The first is for drivers from marginalized communities who may decide to detour to avoid the toll, creating both a time cost (essentially reducing their access), and potentially increased costs for gas and vehicle use. The second concern is whether the mechanics of toll payment ~~shut off~~restrict opportunity by creating barriers to use; for example, requiring drivers to front sums of money (e.g., for transponders or prepaid tolls) or to have a credit card or bank account~~s~~ to link to their accounts~~transponders~~.

Access to Opportunity	
CATEGORY	***SAMPLE INDICATORS***
Funding	• Absolute dollar amount invested in transit and mobility options in/that benefit marginalized communities including: ➢ New transit routes ➢ Increased frequency ➢ Subsidies for vanpools, new mobility options, etc. • Percent of funds from tolls spent supporting expanded mobility options that benefit marginalized communities.
Service Quality	• Changes in transit speed, reliability, and quality that directly impact marginalized communities. • Changes in travel speeds and/or reliability for cars, HOVs, and those paying tolls.
Service Levels	• Number of new transit miles, routes, or transit vehicle levels that benefit marginalized communities.
Transit Use	• Increase in marginalized people's transit ridership attributed to transit investments. • Increase~~Change~~ in the number of riders that use discounted fares each year.

Ratios	• Number of marginalized people paying the toll compared to those that change routes to avoid the toll (note: this information requires extensive surveys). • Amount of investment in marginalized communities vs. other communities.
Access	• Change in the number of jobs, services, etc., that marginalized communities can access within a 30 or 45 minute window, by mode.

QUESTIONS TO ASK:	
2.4	Are key community destinations being analyzed and are any missing?
2.5	What alternative transportation choices (roads, transit, etc.) will be available to those who cannot afford the toll? For those who are likely to drive alternate routes, what is the time penalty?
2.6	Are potential benefits being fully considered (e.g., the potential increase in bus speed), both when the project is implemented and further into the future?

Community Health

Low-income populations and populations of color have historically borne a greater share of the negative health impacts of transportation systems. Freeways were often built through lower-income and minority communities, imposing higher levels of asthma and other health impacts of air pollution and noise. ~~Unsafe streets~~~~Lack of infrastructure mean~~Lack of infrastructure means marginalized communities also have ~~much~~ higher death and injury rates from walking and bicycling.[15]

Pricing strategies can be a way to minimize some of these impacts, by reducing the amount of overall driving taking place, by reducing the need to expand roads and freeways, and by creating revenue streams that can support bicycle and pedestrian infrastructure or clean vehicles.

Commented [SK9]: Can we add Seattle-specific data here?

Commented [SC10]: Hi Kristen. I was able to find Washington State data and I put that in the footnote. Feel free to bring forward here, but I think the footnote is good enough given the data is for the whole state.

I wasn't able to find Seattle specific data and the 2017 Seattle active transportation report does not mention race, just gender, age etc.

http://www.seattle.gov/Documents/Departments/SDOT/About/DocumentLibrary/Reports/2017_Traffic_Report.pdf

Community Health	
CATEGORY	***SAMPLE INDICATORS***
Infrastructure	• Absolute dollar amount of funds spent on bike and pedestrian improvements in marginalized communities. • Miles of effective/safe bike lanes and sidewalks added or improved.
Funding	• Percent of toll revenues spent on bike and pedestrian improvements in marginalized communities.
Safety	• Change in collisions, death, and injury rates due to traffic reduction on facilities that receive investment.
Trips	• Change in the number of bicycle and pedestrian trips.
Air Quality	• Percentage of new clean air buses, funded as part of the toll investment strategy, in vulnerable communities. • Change in particulate matter or other criteria pollutants in identified impact areas.
Health	• Anticipated health benefits, disease reduction, and improvements in life expectancy (can be predicted using ITHIM or another model).

QUESTIONS TO ASK:	
2.7	Do the main health indicators include the ones that were prioritized by marginalized communities?
2.8	Is data on health impacts detailed enough to ascertain impacts on residents within a short distance of the tolled facility and/or other impacted roadways?
2.9	What changes in air pollution are expected? *Where do these occur? Who do they affect?*
2.10	What impacts on bicycle and pedestrian safety are projected?
2.11	Will changes resulting from road pricing reduce traffic and bring more community cohesion? *Would pricing further isolate some communities or particular populations?*

Full Participation

Process equity is focused on participation in the planning and decision-making process. Since low-income groups and communities of color have historically been disenfranchised from full participation, the issue is how to ensure that the views and concerns of these communities, *as*

community members understand and articulate them, are fully solicited, valued, and reflected throughout the process.

The following chart depicts the kinds of activities associated with greater degrees of involvement. This is followed by a table of sample indicators for participation, as well as a table with questions to ask.

Increasing Degree of Participation →					
Level	**Minimal** ⟵		⟶		**Maximum**
Public Participation Goal	Marginalized communities are provided information on the project.	Marginalized communities provide feedback to the goals.	Solicitation of public concerns and aspirations is ongoing.	Agencies closely partner with community groups throughout the project.	Marginalized communities have a seat at the decision-making table.
Sample Outreach Strategies	• Fact sheets • Websites • Open houses	• Public meetings • Public comment • Focus groups • Surveys	• Workshops • Deliberative polling	• Advisory committees • Consensus building • Participatory decision-making	• Resident juries • Ballots • Delegated decisions • Formal representation on decision-making groups

Based on NCHRP and the International Association of Public Participation

Full Participation	
CATEGORY	***SAMPLE INDICATORS***
Activities	• Number of meetings and focus groups with marginalized communities. • Dollar amount and/or percentage of project budget dedicated to equity outreach programs.
Communications	• Number of languages into which materials are translated. • Share of principal languages spoken in the community into which materials are translated. • Number of ethnic media outlets that receive information and publish articles about the proposal, or are targeted for advertising community meetings.
Organizations	• Staff time dedicated to technical support and funding to Community-Based Organizations (CBOs) to conduct/participate in needs assessment.

Participants	• Number of individual voices that have contributed to the community needs assessment.
Responsiveness	• Number of community-identified priorities that are being implemented as part of the program.

QUESTIONS TO ASK:	
2.12	Where is the planning process on the "Degree of Participation" scale? *Does it need more resources or political support to move further right on the spectrum?*
2.13	Are the efforts planned to reach vulnerable populations likely to reach people where they are, or do they expect people to come to planning events?
2.14	Are the comments and priorities of marginalized communities being actively catalogued? *Are there plans to address these priorities in a clear and transparent way?*

ADDITIONAL RESOURCES

Assessing the Environmental Justice Effects of Toll Implementation or Rate Changes: Guidebook and Toolbox has several lists that are useful for additional perspective:

- A checklist for understanding the role of quantitative and qualitative performance indicators (pp. 358-359).
- Table 3 (pp. 135-138), "Practical approaches for reaching low-income, minority, and other traditionally underserved populations," presents an agency-level perspective on reaching members of vulnerable populations.

The Greenlining Institute's *Mobility Equity Framework* identifies 12 Equity Indicators which it recommends for equity studies (pp. 11-13).[16]

PRICING EQUITY STEPS #3-5~~6~~

3. Determine Benefits and Burdens

Once a set of *performance indicators* is adopted, the project team will conduct studies to determine the impacts of the proposed alternatives. The analyses that will go into determining benefits and burdens should be tailored to the *scale* of impacts, community *interest* in those impacts, and the *potential* of those impacts to help or hurt vulnerable populations.

There will likely be an iterative process between this stage and the previous two stages. Results of the analysis will both inform further development of the proposal, and raise new angles in the understanding of the equity impacts, requiring new or amended indicators. International experience suggests that five or more iterations may be necessary.

4. Choose Programs to Advance Transportation Equity

The purpose of this stage is to identify which set of policies and measures can best maximize equity across all groups and minimize the harm to vulnerable populations. Some of the most relevant strategies may already have been identified and even implemented (in part or in full) in local or regional plans or in community group transportation recommendations for other projects.

5. Provide Accountable Feedback and Evaluation

Road pricing strategies, once implemented, will lead to shifts in travel behavior; pricing revenues will also begin to flow to programs and efforts aimed at improving equitable outcomes. The nature of pricing also allows for charge levels, time periods, discounts and – to an extent – charge locations to be adjusted to maintain and maximize positive outcomes and address issues that emerge. O~~In all cases, o~~ngoing monitoring and evaluation can help identify problems or issues that may emerge, as well as point to new opportunities to help advance equity.

SDOT will need to ensure that:

- Monitoring and evaluation occur along a reasonable timeline.
- There are agreed-upon mechanisms for providing feedback to the community and decision-makers on both the successes and shortcomings of the program, as well as to highlight and act upon emerging opportunities.
- The results of monitoring and evaluation are communicated clearly and consistently with affected communities.

~~6. Anticipate and Plan for Future Opportunities~~

~~The evaluation that takes place in Step 5 should be purposeful; it should serve to help shape and re-shape the pricing program. Step 6 builds off this to identify "next steps" in promoting equity so that the process of rebalancing the transportation system can continue.~~ General Equity Impacts of Different Pricing Strategies

Commented [SC11]: We are updating this chart soon and will send it separately in early January.

At ~~its~~ the very highest level, the following chart gives a sense of how a pricing strategy can be inequitable and the different strategies that can make it more equitable or even advance an equity agenda. The "investment strategy" column primarily refers to the allocation of funds generated by congestion pricing, although these funds may be complemented by other sources.

CORDON PRICING EQUITY MATRIX		
STRATEGY	***INVESTMENTS***	***EQUITY IMPACTS***
24-hour **Flat-rate pricing**	Road expansion. New transit is ~~no~~ ~~'~~t particularly focused on vulnerable communities.	Likely to be most regressive strategy, charging low-income drivers who often don't commute at peak commute hours. Not very efficient at increasing vehicle and transit speeds. Investment strategy doesn't add more affordable options.
Dynamic pricing that varies with	Mix of road expansion and transit that serves	Efficient charging system but is regressive (though likely less regressive than gas and sales taxes).

Commented [SK12]: I like the way this ranks types of pricing and types of investments based on their equity impacts, but we need a way to show the pricing strategy and the investment strategy are independent - e.g. a means-based pricing strategy could still spend all the revenues on road expansion. I'm not sure how to show this in two dimensions...

time or congestion	vulnerable communities.		Drivers can potentially shift modes to new more affordable modes.
Dynamic pricing with some means-based discounts	Primary focus on transit, walking, and bike infrastructure. Targeted carpool, vanpool, and new mobility options, especially where transit is thin.		Less regressive due to discounts. Investments allow greater shift to more affordable modes and address community health.
Means-based pricing with targeted caps and/or exemptions	Similar investments as above but with an intensive focus on vulnerable communities. Additionally, fares are reduced on transit and other mobility options.		System designed specifically not to be regressive, becomes even more affordable for some. Some loss of efficiency as plentiful discounts, caps and exemptions may limit the congestion and climate benefits. Significant expansion of commute options further increases overall transportation affordability.

Notes

[1] Martin Wachs, in his history of transportation planning in Los Angeles, notes that LA had for decades planned a relatively balanced set of modal investments, with transit an important component, but the US Federal Interstate Highway Act led to most local and state transportation funds going to freeway building. Martin Wachs, "The Evolution of Transportation Policy in Los Angeles: Images of Past Policy and Future Prospects," in Allen J. Scott and Edward Soja, eds., *The City: Los Angeles a~~A~~nd Urban Theory a~~A~~t t~~T~~he End o~~O~~f t~~T~~he Twentieth Century* (Berkeley and Los Angeles: University of California Press, 1996), 106-159.

[2] Mikayla Bouchard, "Transportation Emerges as Crucial to Escaping Poverty," New York Times (New York, NY, 6 May 2015), p. A3. This article provides a clear summation of the research report, which is otherwise highly technical.

[3] American Public Health Association, "Improving Health ~~Through~~through Transportation and Land-Use Policies," policy statement (10 November 2009), www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/31/08/21/improving-health-through-transportation-and-land-use-policies. Accessed 18 October 2018.

[4] King County Public Health Community Health Needs Assessment: Available at: https://www.kingcounty.gov/depts/health/data/community-health-indicators/~/media/depts/health/data/documents/2018-2019-Joint-CHNA-Report.ashx

[5] City of Seattle Office of Sustainability and Environment. –2014 Seattle Community Greenhouse Gas Emissions Inventory (August 2016). Available a~~p~~t: https://www.seattle.gov/Documents/Departments/OSE/ClimateDocs/2014GHG%20inventorySept2016.pdf

[6] A 2008 study gave 275 household in Seattle a cash sum to spend on driving trips. With equipment to monitor driving they were charged tolls linked to traffic congestion levels, and at the end of the study they could keep money they did not spend. The results showed that pricing affected behavior: travelers altered their schedules, took different routes or collapsed multiple trips into single journeys. The agency in charge showed that if these tolls were implemented regionally they'd dramatically reduce congestion at peak time and increased average travel speeds. Yet the tolls would have to be quite high in some places to achieve that result. Eric Pryne, "Wide use of tolls could unclog roads, Seattle study says," Seattle Times (24 April 2008), www.seattletimes.com/seattle-news/wide-use-of-tolls-could-unclog-roads-seattle-study-says/. Accessed on 2 October 2018.

[7] http://www.seattle.gov/civilrights/programs/race-and-social-justice-initiative/racial-equity-toolkit

[8] greenlining.org/publications/2018/mobility-equity-framework/

[9] A particularly useful paper is Brian Taylor, "How Fair is Road Pricing? Evaluating Equity in Transportation Pricing and Finance," (National Transportation Policy Center, 29 September 2010).

[10] Adopted from National Cooperative Highway Research Program (NCHRP), ***Assessing the Environmental Justice Effects of Toll Implementation or Rate Changes: Guidebook and Toolbox*** (Washington, DC: National Academies Press, 2018), p. 56.

[11] www.seattle.gov/transit/orca-lift. Accessed on 2 October 2018.

[12] www.seattle.gov/transit/orca-opportunity. Accessed on 2 October 2018.

[13] www.seattle.gov/transportation/projects-and-programs/programs/transportation-equity-program. Accessed on 2 October 2018.

[14] Richard D. Plotnick Et al. *A Geography-Specific Approach to Estimate the Distributional Impact of Highway Tolls: An Application to the Puget Sound Region of Washington State*, National Institutes of Health, Author Manuscript, August 7 2011.

[15] People of color and the poor are overrepresented in active transportation fatalities and serious injuries in Washington State. From 2013 to 2017 about 59% of fatal and serious injury crashes in Washington occurred in geographic areas with a rate of poverty higher than the state average, despite these areas only accounting for 43%

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of the population. People living in poverty include an over-representation of people of color the elderly and people with disabilities. From 2013 to 2017 American Indian or Alaska Native people represented 2% of the total population yet accounted for 6% of active transportation traffic fatalities in Washington. From: WSDOT's Active Transportation: Annual Safety Report http://wsdot.wa.gov/publications/fulltext/graynotebook/gray-notebook-Mar18.pdf

[16] Hana Creger, Joel Espino, and Alvaro S. Sanchez, *Mobility Equity Framework: How to Make Transportation Work for People* (Oakland California: Greenlining Institute 2018).

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From: Garman, Kate
To: Zimbabwe, Sam; Adkins, Genesee; Helmbrecht, Elliot; Thompson, Adrienne; Rolf, Kylie; Brinson, Leslie
Subject: E-Team Presentation Today - FINAL
Date: Thursday, March 14, 2019 10:22:53 AM
Attachments: TOD.Transport.Worker Protections. 3.12.2019.pptx

Thank you again for your contributions to this. Here is the final version of our slides. If you need me to change something, please let me know as soon as possible. See you this afternoon!
Kate

TOD/Transportation/Worker Protections Revenue Planning

E-Team Briefing

March 14, 2019

Agenda

- Goals for Policy
- Tax and fees in other cities
- Recap of anticipated revenue and allocation to various spending areas
- Transportation Spend Plan
- Work Protections & Companion OrdinanceUpdate
- Timeline to move forward

Proposal: Goals

[redacted]

Proposal: Specifics

[redacted]

[redacted]

Taxes and Fees in other cities

City	Fee or Tax	Year Most Recent Action Passed	Estimated Revenue	What the revenue is going toward
Massachusetts	$0.20 tax	2016	$13M in 2017	50/50 Earmarked for transportation projects and to help the taxi industry adapt to new technologies and provide job training
New York City	Tax per ride in Manhattan geofence: $2.50 on yellow taxis $2.75 on other for-hire, including TNCs $0.75 for car pool/shared rides	April 2018 – passed at state level	Could generate up to $605M per year	Going toward the subway system
Philadelphia	1.4% tax	2016	$3.6M	$2.6M for public schools, $1M to enforcement and regulation of TNCs
San Francisco	3.25 tax to single-use rides; 1.5% tax rate to shared carpool; AV TNC's would be included in the tax	July 31, 2018	$30M per year	Transportation infrastructure and operations throughout the City
Washington DC	6% tax on revenue	July 2018	$23M per year	Revenue will go toward funding the District Metro. Note: the 6% rate now puts taxis and TNC's at the same tax and fee level

Revenue Projections

[redacted]

Housing Spend Plan

[redacted]

Transportation: Part 1 – Pieces in Motion

[redacted]

Transportation: Part 2 – Needs & Spend Plan

- SDOT has pre-existing budget pressures as well as emerging asset and program needs.

- Spend levels could address both without creating unreasonable expectations.

[redacted]

Worker Protections Part 1

- Policy goals: [redacted]
- Approach [redacted]

Worker Protections Part 2

[redacted]

E-Team Briefing Schedule

- 3/14 Transportation Spend Plan + Worker Protections
- 3/21 FAS Implementation + TOD Spend Plan
- 3/28 Communications, Outreach and Council Strategy
- *[Week of April 1: Mayoral Briefing]*
- 4/4 Confirm spend plans
- 4/11 Driver Protection Companion Ordinance
- 4/18 Department Director Meeting + Strategy of Implementation
- 4/25 SDOT Literature Review Complete

Staff Meeting in Parallel with E-Team

- SDOT
  - Genesee Adkins
  - Elliot Helmbrecht (MO)
  - Kelly Rula
  - CBO Partner: Saroja Reddy
- FAS
  - Doug Carey
  - Glen Lee
  - Mary Mitchell
  - CBO Partner: Jennifer Devore
- OH
  - Miriam Roskin
  - Leslie Brinson (MO)
  - CBO Partner: Julie Dingley
- OLS
  - Jenee Jahn
- CAO
  - Sara O'Connor-Kriss
- MO/CBO
  - Kate Garman
  - Kylie Rolf
  - Adrienne Thompson
  - George Emerson
  - Dave Hennes

Outreach Plan (Kyla/DON)

Communications Plan (Mark/Kamaria)

Council Engagement Plan (Anthony)

From: Rula, Kelly
To: Estey, Mike; VanValkenburgh, Cristina
Subject: FW: Congestion Pricing
Date: Tuesday, April 16, 2019 4:04:30 PM
Attachments: AHR Mayoral Memo Template Draft 4-16-19_SDOT rev.docx

Mike- See attached.

From: Adkins, Genesee <Genesee.Adkins@seattle.gov>
Sent: Tuesday, April 16, 2019 2:40 PM
To: Rula, Kelly <Kelly.Rula@seattle.gov>; Castleman, Kris <Kris.Castleman@seattle.gov>; Lo, Kevin <Kevin.Lo@seattle.gov>; Krawczyk, Tracy <Tracy.Krawczyk@seattle.gov>; Simpson, Kristen <Kristen.Simpson@seattle.gov>; Hobson, Mafara <Mafara.Hobson@seattle.gov>; Melanson, Karen <Karen.Melanson@seattle.gov>; Lorenzana, Candida <Candida.Lorenzana@seattle.gov>; VanValkenburgh, Cristina <Cristina.VanValkenburgh@seattle.gov>; Schellenberg, Dawn <Dawn.Schellenberg@seattle.gov>; Williams, Lorelei <Lorelei.Williams@seattle.gov>
Cc: Zimbabwe, Sam <Sam.Zimbabwe@seattle.gov>
Subject: RE: Congestion Pricing
Here is a revised page 4 with your input from our 1:30 conversation. Thanks, all – Genesee

From: Adkins, Genesee
Sent: Tuesday, April 16, 2019 12:04 PM
To: Rula, Kelly <Kelly.Rula@seattle.gov>; Castleman, Kris <Kris.Castleman@seattle.gov>; Lo, Kevin <Kevin.Lo@seattle.gov>; Krawczyk, Tracy <Tracy.Krawczyk@seattle.gov>; Simpson, Kristen <Kristen.Simpson@seattle.gov>; Hobson, Mafara <Mafara.Hobson@seattle.gov>; Melanson, Karen <Karen.Melanson@seattle.gov>; Lorenzana, Candida <Candida.Lorenzana@seattle.gov>; VanValkenburgh, Cristina <Cristina.VanValkenburgh@seattle.gov>; Schellenberg, Dawn <Dawn.Schellenberg@seattle.gov>; Williams, Lorelei <Lorelei.Williams@seattle.gov>
Cc: Zimbabwe, Sam <Sam.Zimbabwe@seattle.gov>
Subject: Re: Congestion Pricing
Apologies for any confusion: We have time today at **1:30** (not 12:30) in rm **4155**. Thanks!

On Apr 16, 2019, at 11:13 AM, Adkins, Genesee <Genesee.Adkins@seattle.gov> wrote:

All: Here is my shot at our 1-page summary for the briefing book (see page 4). Have a look before our 12:30 meeting if you can. Otherwise, hope to see a critical mass of you then. Thank you! – Genesee
-----Original Appointment-----
From: Cawaling, Cindy **On Behalf Of** Adkins, Genesee
Sent: Monday, April 15, 2019 5:32 PM
To: Adkins, Genesee; Rula, Kelly; Castleman, Kris; Lo, Kevin; Krawczyk, Tracy; Simpson, Kristen; Hobson, Mafara; Melanson, Karen; Lorenzana, Candida; VanValkenburgh, Cristina; Schellenberg, Dawn; Williams, Lorelei
Cc: Zimbabwe, Sam
Subject: Congestion Pricing
When: Tuesday, April 16, 2019 1:30 PM-1:55 PM (UTC-08:00) Pacific Time (US & Canada).
Where: Sam's Office / 38th Floor SMT
Genesee has requested this follow up meeting.

<AHR Mayoral Memo Template Draft 4-16-19_SDOT.docx>

To: Mayor Jenny A. Durkan
Date: April 19, 2019
Subject: Affordable Housing Revenue
From: Kate Garman, Kylie Rolf, Edie Gilliss, Shefali Ranganathan

Purpose: We are briefing you next week to present our updated proposal on affordable housing revenue. The materials attached to this briefing review the proposal, relevant spend plans, implementation requirements, and a communications/outreach strategy. We seek your guidance and approval on proposed next steps.

Summary: We are proposing to place a tax on transportation network companies on a per ride basis for the purpose of:

- Curbing the congestion impact of TNCs
- Increasing TOD affordable housing supply
- Improving transit and mobility options
- Protecting drivers by requiring fair pay and fair treatment

Background: Subsequent to our last briefing in the fall, we have set up the following tax structure:

[redacted]

[redacted].

[redacted]

Recommendations/Options/Next Steps: A briefing is scheduled next week to review this memo and discuss next steps.

Appendix

[redacted]

Appendix 1: TOD Affordable Housing Spend Plan
Office of Housing
From: [Authors] – Please limit to no more than 2 pages, 1 preferred.

[redacted]

Policy Goal/Purpose:

Summary: *include here target community/audience, other details as necessary (what qualifies under TOD)*

Proposal:

Impact: *if this redundant and you've included this in proposal, delete this section. Units provided, mobility options increased per year, etc.*

Appendix 2: Transportation Spend Plan
Seattle Department of Transportation
From: Sam Zimbabwe

[redacted]

Policy Goal/Purpose:

[redacted]

Summary:

[redacted]

Proposal:

1. **Strengthening Our Multimodal Network**

[redacted]

2. **Mitigating the Impacts of TNCs**

[redacted]

Appendix 3: [redacted]

[redacted]

<u>Policy Goal/Purpose:</u>

Summary: [redacted]

<u>Proposal:</u>

<u>Impact:</u> *if this redundant and you've included this in proposal, delete this section. OLS- I think highlighting what other cities are doing, or rather that we are the first to do something.*

Appendix 4: Implementation Requirements – Schedule and Budget

Finance and Administrative Services
From: [Authors] – Please limit to no more than 2 pages, 1 preffered

Policy Goal/Purpose:

Summary: *of time and cost to implement*

Proposal:

Section on cost

Section on implementation timeline and requirements

Appendix 5: Communications, Outreach, and Council Engagement Proposal/Next Steps
Office of the Mayor
From: [Authors] – Please limit to no more than 2 pages.

Policy Goal/Purpose:

Summary: *of time and cost to implement*

Proposal:

Section on cost

Section on implementation timeline and requirements

From: Finn Coven, Jessica
To: Ranganathan, Shefali; Rolf, Kylie; Simpson, Kristen; Adkins, Genesee; Gilliss, Edie
Subject: FW: EMBARGOED RELEASE: Congestion Pricing as an Equity Solution
Date: Monday, January 28, 2019 10:14:27 AM
Attachments: Pricing_Roads_Advancing_Equity_Combined_FINAL_190125.pdf

Hi all,
Tomorrow NRDC will be releasing a report on how congestion pricing can increase equity. Haven't read it, but an embargoed copy is attached. SDOT friends, can you let us know if there are any discrepancies between this report and our white paper? I'll also try to read today to flag things we may want to highlight from the report.

Thx,
JFC

From: Eaken, Amanda <aeaken@nrdc.org>
Sent: Monday, January 28, 2019 9:28 AM
To: Finn Coven, Jessica <Jessica.FinnCoven@seattle.gov>
Subject: FW: EMBARGOED RELEASE: Congestion Pricing as an Equity Solution
Here is the report as you requested. It's quite similar as I believe TransForm is working on yours as well. Feel free to try my cell if you have any questions – 415-385-6456 – it's out now.
A
From: Edie Irons <eirons@transformca.org>
Sent: Monday, January 28, 2019 8:14 AM
To: Birdseye, Kari <kbirdseye@nrdc.org>
Subject: EMBARGOED RELEASE: Congestion Pricing as an Equity Solution

EMBARGOED RELEASE:

DO NOT PUBLISH BEFORE 7am on Tuesday, Jan. 29, 2019

Contacts: Edie Irons, TransForm, eirons@transformca.org, 510-334-1344

Kari Birdseye, NRDC, kbirdseye@NRDC.org, 415-875-8243

Road Pricing can Fix Traffic *and* Inequities

New report and toolkit show how congestion pricing can improve transportation equity, while reducing traffic and climate emissions

(Oakland, CA) — As worsening traffic congestion, rising climate emissions, and growth in urban areas confound communities across the country, city leaders are turning to congestion pricing as a powerful and proven solution. As the conversation in places like the San Francisco Bay Area, Seattle, Los Angeles and New York has advanced, it's clear that congestion pricing will only be successful when it puts social equity at the center of any program. A new report gives cities a roadmap for how to cut congestion while increasing fairness for our cities' most vulnerable residents — changing the debate from "why should I pay?" to "how should we invest?" in our community's mobility and infrastructure.

Pricing Roads, Advancing Equity, a new report and toolkit from TransForm and the Natural Resources Defense Council, shows how pricing roads can make our transportation system *more* fair and equitable. The report includes case studies from cities around the world, implementation strategies, and a detailed toolkit that equity advocates, decision-makers, and planners can use to design equitable pricing proposals.

“What used to sound radical now sounds like common sense — road pricing is urgently needed to address climate change, traffic, and inequity in the transportation system,” said Stuart Cohen, executive director of TransForm and a co-author of the report. “We believe road pricing can be a transportation equity solution. It can speed buses and carpools while providing revenue to make mass transit more affordable.”

Just last week, the Los Angeles County Metropolitan Transportation Authority’s Board of Directors voted to study the equity implications of congestion pricing before further policy development on the matter. This report should make that task much easier. *Pricing Roads, Advancing Equity* explains how pricing revenue could fund transit passes for vulnerable populations like youth, seniors, and people with disabilities; discounted car share and bike share memberships; rebates and subsidies on regressive vehicle licensing fees; or exemptions and discounts to the congestion price itself.
“The transportation status quo is far from equitable,” said Amanda Eaken, NRDC’s Director of Transportation and Climate. “Free roads hide the real costs of driving — traffic congestion and pollution that disproportionately harm vulnerable communities.”

In addition to the congestion pricing being considered in car-clogged downtowns, the report shows how the growing and widespread use of express lanes, where solo drivers can pay a toll to get into the fast lane, can also be a climate and equity solution. In places including Los Angeles, express lane revenue is already being targeted to help low-income commuters with discounts and more frequent transit service. The report also finds that, in the long run, converting general purpose lanes into express lanes — if paired with new public transit and other equity provisions — can help avoid the need for new and wider highways.

“California has nearly $70 billion of new roads and highway widening in the works, which flies in the face of our climate goals,” said Cohen. “Our transportation dollars should be expanding transit, bicycle, and pedestrian projects that improve access and safety for vulnerable communities. This report provides tools and strategies to change tactics and address some of our biggest crises, rather than doubling down on what got us into this mess.”

# # # #

TransForm is a nonprofit advocacy organized that promotes walkable communities with excellent transportation choices to connect people of all incomes to opportunity, keep California affordable, and help solve our climate crisis. Visit us at www.transformca.org and on Twitter @TransForm_alert

The Natural Resources Defense Council (NRDC) is an international nonprofit environmental organization with more than 3 million members and online activists. Since 1970, our lawyers, scientists, and other environmental specialists have worked to protect the world's natural resources, public health, and the environment. NRDC has offices in New York City, Washington, D.C., Los Angeles, San Francisco, Chicago, Bozeman, MT, and Beijing. Visit us at www.nrdc.org and follow us on Twitter @NRDC.

This report was made possible by grants from the William and Flora Hewlett Foundation, Silicon Valley Community Foundation, Lisa and Douglas Goldman Fund, The San Francisco Foundation, and the Natural Resources Defense Council.

Edie Irons, Communications Director
TransForm
436 14th Street, Suite 600, Oakland, CA 94612
office: 510.740.9310
cell: 510.334.1344
Save the date for a big celebration with TransForm on April 11, 2019!
Sign up for our emails at www.TransFormCA.org. Follow us on Facebook, Twitter, and Linkedin, too.

TransForm

Our communities. Our transportation. Our future.

A Report and Toolkit to Help Communities Advance a More Equitable and Affordable Transportation System

PRICING **ROADS,** ADVANCING **EQUITY**

PRICING **ROADS**, ADVANCING **EQUITY**

TransForm promotes walkable communities with excellent transportation choices to connect people of all incomes to opportunity, keep California affordable, and help solve our climate crisis. With diverse partners we engage communities in planning, run innovative programs, and win policy change at the local, regional, and state levels.

www.transformca.org

Publication Date: January 2019

Acknowledgements

Stuart Cohen and Alan Hoffman are the authors of *Pricing Roads, Advancing Equity*. Stuart is TransForm's Founder and Executive Director. Alan is a Bay Area transportation planning and policy specialist.

Chris Lepe wrote several case studies and provided important comments throughout. Edie Irons edited the report and toolkit. As interns for TransForm during their graduate studies, Zack Deutsch-Gross and Matthew Chiodo did foundational research, collecting sources materials, writing initial drafts of case studies and early sections of the report, conducting interviews, and summarizing articles.

Leading equity advocates and transportation planners from around North America helped shape the focus of the report, provided local examples, and gave strategic advice. Primary reviewers included:

Bob Allen
Urban Habitat, Oakland

Cara Bader
City of Chicago

Shoshana Cohen
Portland Bureau of Transportation

Hana Creger
Greenlining Institute, Oakland

Naomi Doerner
City of Seattle Department of Transportation

Amanda Eaken
Natural Resources Defense Council

Daniel Firth
Mobility Pricing Independent Commission, Vancouver BC

Tyler Emilie Frisbee
Portland Metro

Jeff Hobson
San Francisco County Transportation Authority

Joe Iacobucci
Sam Schwartz Transportation Consultants

Jason Kligier
City of Santa Monica

Jessica Meaney
Investing in Place, Los Angeles

Kevin O'Malley
City of Chicago

Carter Rubin
Natural Resources Defense Council

Sam Schwartz
Sam Schwartz Transportation Consultants

Hester Serebrin
Transportation Choices Coalition, Seattle

Kristen Simpson
City of Seattle Department of Transportation

Francie Stefan
City of Santa Monica

Stephanie Williams
Better Environmentally Sound Transportation, Vancouver BC

This report and toolkit were developed with support from the William and Flora Hewlett Foundation, Lisa and Douglas Goldman Fund, Silicon Valley Community Foundation, the San Francisco Foundation, and the Natural Resources Defense Council. The information and opinions expressed in this report and toolkit are solely those of the authors and do not necessarily reflect the views of the funding partners.

Photo credits: Michael Halberstadt (front cover)
Report design: Alan Hoffman

Contents

INTRODUCTION

Pricing Roads, Advancing Equity Report and Toolkit

Inequities have long been ingrained in our transportation system. Vulnerable communities—which include high concentrations of low-income households, people of color, and those disadvantaged due to ability, age, or other factors—have long borne the brunt of negative transportation impacts while paying a proportionally larger share of their income to get where they need to go.

Meanwhile, in response to worsening road congestion, inadequate funding sources, and climate change considerations, cities and regions across North America have begun implementing road pricing programs. While equity issues are often analyzed as part of pricing studies, the primary focus has been on minimizing negative and disproportionate impacts on vulnerable communities, as opposed to maximizing benefits and redressing historic or systemic inequities.

When implemented without a clear focus on social and racial equity, road pricing programs can burden low-income drivers with new costs and deepen existing inequities. But when equity concerns and deep community engagement help shape road pricing programs and their reinvestment strategies, they can lead to more frequent and affordable public transit, safer pedestrian and bicycle routes, and improved health outcomes for vulnerable communities—all important components of an equitable transportation system. Discounts and exemptions for low-income households can create progressive pricing structures. In short, road pricing programs can be an effective tool for making transportation systems more equitable; this report and associated toolkit demonstrate how to achieve this goal.

TransForm believes that if public agencies use equity goals to help drive road pricing studies from the beginning, the results can greatly benefit both vulnerable communities and the broad range of individuals in those communities. Pricing can deliver a wider range of mobility options that are fast, frequent, and affordable, improving access to economic, recreational, social, and other opportunities.

The goal of this report and toolkit is to challenge policymakers and equity advocates to act on this key proposition: that structural inequity in our transportation system may be remedied in part by effective, equitable road pricing.

Road pricing can take many different forms. **Chapter 1 of this report explains the need for road pricing and the forms it can take, as well as the equity concerns involved.** It looks especially at HOT (High-Occupancy/Toll) Lanes and Cordon or Area Pricing. HOT lanes are often converted from standard HOV (High-Occupancy Vehicle, also known as “carpool lanes”) or general

purpose lanes; they are usually free for carpools, while any excess capacity may be used by solo drivers willing to pay a toll, which typically varies based on supply and demand. Cordon or Area Pricing, in which autos pay a charge to enter and/or circulate within a defined zone, has not yet been implemented anywhere in North America but is of growing interest as a means of decongesting city centers and similarly dense zones. London, Stockholm, and Singapore have used Cordon or Area Pricing to achieve positive transportation, public health, and even equity outcomes; American cities including New York and San Francisco have been exploring whether such pricing may work for them.

Chapter 2 of this report looks at examples of cities in the U.S. and Canada that have studied road pricing, both as an alternative to road expansion and to manage downtown congestion, and further looks at how equity concerns were incorporated into these studies.

Chapter 3 of this report examines a range of strategies to achieve equitable outcomes, focused on full participation, affordability, access, and community health. It also looks at methods for achieving the full participation of vulnerable communities in the planning process. Examples from cities across North America describe how communities are beginning to use pricing programs to advance an equity agenda.

Chapter 4 introduces the accompanying toolkit, which is designed to complement this report and help planners implement equitable road pricing strategies. TransForm's companion toolkit outlines five key steps for implementing a pricing program, with questions to ask, sample performance measures, and resources for each step of the way. While the toolkit is primarily intended for policymakers and equity advocates that are actively considering a road pricing strategy, there are many case studies and tools that are interesting and useful in their own right for a variety of audiences and purposes.

Together, the *Pricing Roads, Advancing Equity* report and toolkit offer a roadmap to help ensure that vulnerable populations can derive real, tangible benefit from road pricing projects.

CHAPTER 1

How Can Road Pricing Advance Equity?

Transportation has reinforced inequality

America's transportation investments and policies have helped to create—and reinforce—racial and social inequities. Since the 1950s, the emphasis on moving cars quickly, combined with sprawling land use patterns, has imposed real costs on *vulnerable communities*. Those within such communities—which include low-income households, people of color, immigrants, and those disadvantaged due to ability, age, or other factors—are less likely to own cars and are more reliant on walking and public transit. Yet the combination of unsafe walking and bicycling conditions and inadequate public transportation has limited access to opportunities for those who need it most.[1] A recent Harvard study found that such access (measured as commuting time) was the *single strongest factor* shaping whether people can escape poverty.[2]

Transportation investments have not only favored those with the resources to own, operate, or otherwise gain access to a motor vehicle; they have often funded roads that ripped right through vulnerable communities. Many of these investments have left multi-generational scars that include physical division of the community, safety issues due to high-speed traffic, and lower property values. Vulnerable communities have also borne the brunt of air quality impacts, with elevated rates of asthma and other illnesses triggered by air pollution.[3] Racial inequities, in particular, are deep, pervasive, and persistent in the United States, and the transportation sector is no exception.

Lower-income families also spend a much higher percentage of their income on transportation.[4] Transportation spending will likely continue to increase for these families, as low-income renters are increasingly priced out of walkable neighborhoods near public transit. This displacement itself can decrease access to opportunities and increase costs as families rely on private vehicles for more and longer trips.

The right transportation policies and investments, along with real and effective participation of vulnerable communities in decision-making, are critical to overcoming some of the most important barriers that limit too many people from finding and keeping a good job, getting an education, and being healthy.

Regions are searching for new transportation strategies

Planning agencies increasingly acknowledge transportation inequities. Cities and metropolitan regions, however, face a host of interrelated transportation challenges, such as traffic

congestion, flat or declining transit ridership, growing maintenance costs, and the need to reduce greenhouse gas emissions.

Traffic congestion often tops the list of public grievances and it is getting worse in almost every region.[5] New roads and wider highways don't solve the problem—they just invite more driving.[6] Even the massive Katy Freeway in Houston has seen congestion levels return to what they were before its expansion to 23 lanes, with afternoon commute times on the 29-mile stretch from Pin Oak to Downtown increasing 55% between 2011 and 2014.[7]

Many investments in public transit over the past few decades have also not fully realized their potential. Most bus and some light rail systems get caught in congestion, leading to higher operating costs. Most U.S. systems are losing ridership—and fare revenue—as passengers opt for faster options.[8] It is worth noting, though, that in places like Seattle that are working to get buses out of traffic, bus ridership is growing.

Building our way out of these transportation challenges is an increasingly dim prospect. Almost every city and region in North America is struggling with higher costs to operate and maintain aging road and transit infrastructure (and maintenance backlogs often play out inequitably, hitting vulnerable communities hardest). It is also increasingly expensive to add highway lanes and new rail lines, especially in areas that are already developed.

More recently, the threat of climate change is motivating action. Transportation is now the country's largest source of climate pollution and continues to be a top source of local air pollution, especially in urban areas and areas adjacent to freeways.[9] In transportation planning, climate considerations are rising on the policy agenda.

Planning agencies across North America are desperately searching for tools to improve transportation systems, address environmental and public health challenges like air pollution and climate change, and provide stable revenues to fund operations, maintenance, and targeted expansion. These challenges are some of the main reasons that agencies across North America are studying and implementing different types of road pricing.

What is road pricing? How does it work?

The US already has over 5,000 miles of tolled roadways.[10] While tolling has traditionally been applied to whole roads, bridges, and tunnels, two relatively new forms of pricing, aimed specifically at managing demand, are taking center stage in North America: *HOT lanes* and *cordon and/or area pricing*.

HOT lanes are quickly expanding across the country. These "High-Occupancy Toll" lanes, often called express lanes, are essentially carpool lanes that also allow solo drivers in for a fee, when there is unused capacity. The revenue from express lanes is often used to fund the highway expansion needed to create the lane, although sometimes existing carpool or HOV lanes or road shoulders are converted to create the HOT lane. These lanes can be more efficient overall than carpool lanes since there is a way to make use of unused capacity.

Cordons **are a form of pricing that charge a fee every time a vehicle enters or exits a defined area or zone. *Area pricing* is similar, except that vehicles are charged for circulating *within* that zone as well. Cities such as Stockholm, Milan, and Singapore have cordon pricing to enter their downtowns, while London employs area pricing for driving within its central zone.**

Types of Road Pricing	
Dynamic or Variable pricing	Rates vary with demand; when the tolled facility is lightly used, rates are low; as the lane begins to fill, rates rise to ensure that fewer cars enter the facility (usually to maintain free-flow speeds).
Cordon pricing	Cordon pricing is typically applied to a Central Business District (CBD, or downtown) or other similar traffic-congested zones; motorists typically pay a charge to enter the zone, typically using an electronic transponder in the vehicle or license plate readers at entry points.
Area pricing	Similar to cordon pricing, except vehicles that travel within the designated zone.
Distance-based charging	A type of road pricing in which vehicles are charged based on distance traveled. Sometimes referred to as a VMT (vehicle miles travelled) fee.
Congestion point charging	A type of road pricing in which vehicles pay a charge or toll when crossing key points, much like cordon pricing.
Full-facility tolling	All users of the facility pay the toll. A “facility” may be a highway, a bridge, a tunnel, or any other roadway.
Managed lanes	Typically located within freeways, a lane or set of lanes for which access is restricted to HOVs or those paying a toll. Toll pricing on managed lanes may vary in response to changing congestion conditions, and HOVs may travel free or at discounted toll rates.
HOV lanes	“High Occupancy Vehicle” lanes are a type of managed lane giving exclusive use to vehicles with the required minimum number of occupants for all or part of a day, generally two (HOV 2+) or three (HOV 3+) persons.
HOT lanes	“High Occupancy/Toll” lanes are for use by carpools, with excess capacity available to single-occupancy cars that pay a toll. HOT lanes use electronic toll collection and traffic information systems to provide variable, real-time toll pricing. Drivers decide whether or not to use the HOT lanes or the general-purpose lanes based on price levels and travel conditions received via message signs.
Express lanes	Express lanes are toll lanes, available for any car paying a toll which varies with demand. Unlike HOT lanes, Express lanes charge all vehicles (including HOVs) for passage. In some cases, discounts may be given to HOVs. Enforcement is simpler and less costly than HOT lanes because there is no need to enforce vehicle occupancy.
Flat rate tolls	These are toll rates that do not change, such as $5 to cross a toll bridge regardless of time of day or demand.

London exempts many vehicles from paying the congestion charge, including those belonging to and/or driven by people with disabilities, low-emission vehicles, and for-hire-vehicles such as

taxis and ride-hailing services. Rapid growth of the latter, though, has contributed to new congestion and is forcing a reevaluation of the pricing strategy to keep it current and effective.[11]

Both New York and San Francisco have considered cordon pricing as a way to reduce congestion, but neither has yet moved forward, in part due to equity concerns.[12] Vancouver (Canada), Seattle, Auckland (New Zealand), and Los Angeles are also starting to consider congestion pricing in or around their downtowns and other congested zones.

Pricing strategies are gaining traction

Road pricing can be a powerful tool for helping achieve transportation system goals; it can simultaneously reduce demand during peak times, make more efficient use of infrastructure, and create a new source of funding for more equitable transportation solutions. It can significantly improve the efficiency of a transportation system that is reeling from overuse and severe capacity constraints.[13]

Road pricing is based on a fundamental economic principle: ***when people have to pay the true cost for something, they use it more efficiently.*** The true costs of driving are not just reflected in construction and maintenance costs, or what people pay in taxes; they also include the *external* costs of congestion, pollution, collisions, etc. When road pricing reflects some or all of these costs, some people make changes to at least some of their trips. They may move some to off-peak times, choose different destinations, switch modes (whether occasionally or regularly) or consolidate their trip-making, reducing the pressure on roadways.[14] Those that pay enjoy a faster, more reliable trip. Even a relatively small reduction in the number of vehicles on a congested road can improve a road's throughput, significantly reducing delays for *everyone*.

Yet pricing can generate its own set of issues. ***If implemented without a clear focus on social and racial equity, it can deepen existing inequities in our transportation system and in society at large.*** It can burden low-income commuters with new costs, just when skyrocketing housing costs are forcing some to move out of transit-rich urban centers and rely on private vehicles for more and longer trips. If the revenue raised by road pricing is used primarily to build new roads, pricing could end up inviting yet more driving, increasing emissions and climate pollution, and limiting the potential to support alternatives.

It is important to evaluate the impact and efficacy of road pricing not in a vacuum, but in comparison to viable alternatives or the status quo. For example, sales taxes and parcel taxes—which we often use to fund transportation—are not only *regressive,* but also *inefficient,* since they make it seem like use of the roads is free, and thus induce excess driving.[15] Road pricing charges are paid only by users, rather than the entire public, so they don't impose an unfair burden on non-driver households (which are often low-income people of color).

Equity and sustainability concerns with road pricing

Some equity concerns are common to road pricing strategies. The most potent may be that they might be regressive. Another is whether the mechanics of toll payment (such as requiring users to front sums of money or have bank accounts to link to their transponders) limit access for low-income people.

Perhaps the biggest affront is that road pricing can appear to create a two-tier transportation system. For HOT lanes that means those who can afford it are able to drive quickly while those on limited budgets are relegated to sit in traffic congestion (hence the moniker “Lexus Lanes” that has stuck in some areas). While people of all incomes do use the lanes and surveys show that people of all incomes appreciate the choice of using the lanes when needed, it is also true that middle and upper income drivers use them more frequently.

For cordon or area pricing, there is often concern that people from vulnerable communities might be unable to afford to make trips they currently make, especially their regular commute. For some people this may lead to detours, shifting modes or their time of travel, or even changing their designation to avoid the new charges. It may also create new costs with regard to both time and increased gas and vehicle use.

London’s program has received the most attention in the U.S. London has conducted regular analyses of equity impacts both before and after implementing area pricing. Concerns about the equity of the London program center on whether it is *progressive* overall (due to the focus on expanding and improving public transit links) or *regressive* (as low-income drivers who drive into the central zone pay the congestion charge).[16]

Cordon and area pricing have generally reduced driving by 15-20% and congestion by 30% or more.[17] Several of these programs started as pilots since they were not popular when first proposed. In Stockholm just a third of the public was in favor of the program before the pilot. After the pilot was implemented, support eventually rose to two-thirds as people came to understand the policy and enjoy the benefits.[18]

In some cases, HOT lanes have reduced average vehicle occupancy as some carpoolers opt to drive solo and pay the charge—especially when there is a conversion of HOV-2 (HOV lanes open to cars carrying at least 2 people per vehicle) to HOT-3 (lanes open to cars carrying at least 3 people or to those in other vehicles willing to pay the toll).[19]

These concerns are all valid. Yet it is also possible to design a system that overcomes them. It is possible to harness the efficiency of road pricing to move public transit more quickly, support new mobility choices, and decrease driving and pollution. With targeted discount and exemption programs, it is even possible that people from vulnerable communities who still need to drive can *benefit* from the decrease in congestion and increase in reliability.

CHAPTER 2

Exploring the Link Between Road Pricing and Equity

Most road pricing projects implemented in North America, to the extent they truly considered social equity, have focused on mitigating harm. Out of all the projects reviewed, Los Angeles' HOT lane implementation is the one that has taken equity issues most seriously, demonstrating several useful methodological and implementation strategies. The companion toolkit to this report features breakout boxes describing how Los Angeles addressed the relevant equity issues.

Discussed below are five efforts that suggest a new model for using the efficiency of pricing as a tool to advance social and economic equity. While the examples are all in coastal states, some of the good work being done in places like Dallas/Fort Worth (featured in the Toolkit) points to the potential for a wide range of geographies and political environments.

One thing is certain, though: ***we will not effectively resolve inequities in our transportation system unless improving equity is a major project goal for road pricing proposals.*** Such concerns need to help drive and lead the agenda, not follow it.

This report focuses on two major ways road pricing can advance an equity agenda: as an alternative to highway widening and as a tool for managing congestion in downtowns and similarly dense urban areas.

Pricing as an alternative to highway widening

Portland, Oregon offers an interesting example of road pricing as an alternative to highway expansion. When the Oregon Department of Transportation (ODOT) had proposed to convert auxiliary lanes (exit and entry lanes) on I-5 to through-lanes, it triggered a range of responses among stakeholders from vulnerable communities.

While some were happy to see community-level improvements incorporated into the project—new park space and landscaping, for example—others were concerned about the impacts of road widening on the community, particularly in terms of air quality. One group, No More Freeways PDX, proposed instead that ODOT implement road pricing on that segment of freeway to better manage demand and reduce or eliminate the need for the road expansion.

While the $450 million project was ultimately approved, the concerns among representatives of affected vulnerable communities and other anti-expansion advocates made an impact. The Oregon State Legislature directed ODOT to conduct a pricing study for the entire freeway, as

well as a section of another freeway, so that traffic levels could be managed through pricing in the future, making any further expansion unnecessary. To this end, ODOT also formed a 24-member Portland Region Value Pricing Policy Advisory Committee (PAC), including representatives of local governments in Oregon and Washington, the business community, highway users, equity and environmental justice advocates, and public transportation and environmental advocates.

In this respect, while the proposal for road pricing ultimately failed to stop one proposed freeway expansion, it made it much more likely that pricing will help prevent the need for future widening projects statewide.

San Francisco Bay Area. TransForm has led a multi-year campaign in the Bay Area to fight the proposed widening of eight-lane Highway 101 between San Jose and San Francisco, and instead promoted the conversion of an existing general purpose lane in each direction to HOT-3.

TransForm made the case that the financial savings from converting rather than widening, in addition to HOT lane revenues, should be used to expand and improve transit options and to provide incentives for vanpooling and carpooling. TransForm also pushed for an equity strategy to expand successful programs like free transit passes for service workers. The regional transportation planning agency, MTC, performed a study in 2015 that confirmed the effectiveness of this approach: a convert and optimize strategy had strong mobility benefits, but without the negative impacts of widening. [20]

While the Environmental Impact Report (EIR) that began in 2015 included the conversion alternative, the lead agencies couldn’t model all of the interrelated elements of TransForm’s proposal within the constraints of the EIR. For example, they lacked the capability to model the benefits of transportation demand management and new mobility strategies, only including some new express bus service in the model.

Another critical component of the alternative, the City/County of San Francisco’s study of lane conversion all the way through downtown San Francisco, was not far enough along in the planning process to include. As a result, the EIR’s conversion alternative routed the express buses through highly congested lanes once they neared San Francisco, resulting in too little improvement in mobility and reducing the apparent viability of the alternative. The conversion alternative was thus rejected by planning staff (even though congestion would also increase significantly in the widening alternative that was adopted).[21]

While that particular proposal for conversion rather than widening on 13 miles was rejected, three elements of TransForm’s framework for equitable and efficient pricing are moving forward in different ways:

- Both San Mateo and San Francisco counties will soon initiate equity analyses for the Highway 101 corridor.

- Two of the agencies along the corridor, SamTrans for the Dumbarton Bridge[22] and the San Francisco County Transportation Authority (SFCTA) for the San Francisco portion of

the corridor, are analyzing conversion of general purpose lanes. MTC is also now analyzing the potential for lane conversion to create a complete regional express network. [23],[24]

- Six transportation agencies have agreed to develop a 101 Mobility Action Plan to optimize the use of the lanes. Equity-driven solutions and the potential for social mobility are key parts of the project mission.

Congestion pricing for downtowns

Congestion pricing for downtowns is not yet practiced in North America, but as big cities get more congested and as climate concerns rise on their policy agendas, it is of growing interest. The authors' review of downtown pricing proposals suggests that these have greater potential to advance equity than HOT lanes—in part because the vast majority of low-income commuters into city centers are not driving their personal vehicles, but would gain mightily from expanded, faster, and more reliable transit. Four current efforts to implement congestion pricing are briefly described below.

New York City has seen several congestion pricing proposals since 2006. In 2014, former Traffic Commissioner Sam Schwartz—looking to overcome opposition to Mayor Bloomberg's pricing plan that drew the ire of the outer boroughs—proposed a "Move NY" plan that focused on both geographic and income equity. The chart on the next page is adapted from Move NY's infographic explaining the proposal; it highlights how the charge could produce real and significant benefits to low-income New Yorkers through support of transit and travel discounts. State-level legislation to implement Move NY was introduced in 2016 but did not pass.

In response to continued overcrowding and delays on NYC's subways and buses another plan was developed in January 2018.[25] The Fix NYC Advisory Panel Report directly linked congestion pricing to new investments in transit, particularly for the outer boroughs and suburbs—recommending that such investments begin even before the implementation of a cordon charge.

The phased approach included a proposal, adopted by the state legislature, to first charge $2.50 for taxis, $2.75 for Uber, Lyft or other for-hire vehicles, and 75 cents for app rides that are shared. This charge was halted by a judge just ten days before its planned implementation on January 3, 2019. The final phase of the plan included a new congestion charge for other vehicles entering downtown and was expected to raise between $810 million and $1.1 billion annually, much of which would be invested in the public transit system where it would provide benefits for many of the city's low-income residents.[26]

Just at the very end of 2018, the bipartisan city/state Metropolitan Transportation Sustainability Advisory Group released a report recommending a congestion pricing zone in the Manhattan commercial district with all proceeds going to the MTA for transit capital and operations.[27] Governor Cuomo, in his 2019 state budget proposal, has called for congestion pricing to be finally adopted for New York City.[28]

Move NY's Solution to Get NY Moving Again[29]			
THE PROBLEM	**For far too long transportation needs of New Yorkers have gone unanswered.**		
	Our roads are clogged with traffic and ridden with potholes.	**Our transit** is outdated and buses are overcrowded, service is scarce in parts of the city.	**Our tolls & fares** are skyrocketing with little return on our investment.
THE SOLUTION	**Create a sustainable, dedicated revenue stream for our transportation system.**		
	Adopt A fairer tolling system that reduces tolls where there's less traffic and fewer transit options and adds them where traffic is heaving and transit options are plentiful.	**Empower** communities and their representatives to make local transit investment decisions.	**Safeguard** the revenue through bond covenants to avoid robbing Peter to pay Paul.
INVESTMENTS	**PayGo** Total: $1.465 billion per year	**Bonded** Total: $15 billion	
CITYWIDE BENEFITS	Extend citywide commuter rail discounts for 7 days a week Create new discounted monthly pass for combined commuter rail, subway, and bus rides $2.8 billion per year in increased economic activity Fair Fares (discounted metro cards for low-income New Yorkers)	Faster travel inside & outside the Central Business District New ferry service 30,000+ new, local jobs Improved roads and bridges Toll relief on 7 MTA bridges $1 off all Express Bus fares	
THE NUTS & BOLTS	**Reduce tolls up to 48%** Toll savings on Triboro, Throgs Neck, Gil Hodges, Henry Hudson, Cross-Bay, Whitestone & Verrazano **Equalize entrance into CBD (Central Business District)** Tolls on East River Bridges and across 60th Street same as Brooklyn Battery and Midtown Tunnels **Treat "For-Hire Vehicles" equally** Uniform surcharge within Manhattan taxi zone; CBD toll exemption **Protect small businesses** Tolls capped at one round-trip per day; 2-3 more daily deliveries or service calls possible per business due to less traffic **Adopt variable pricing** Drivers avoid higher tolls by opting to travel during off-peak hours		

San Francisco completed a study of downtown cordon pricing in 2010, and with congestion rising quickly since then, the San Francisco County Transportation Authority (SFCTA) is reviving consideration of the proposal. The 2010 study found that a cordon around the city's northeast quadrant, encompassing the Central Business District (CBD) as well as several congested

neighborhoods, would be the most practical. The study found that less than six percent of peak period travelers to the focus area were low-income drivers. SFCTA proposed a 50% discount for those commuters as well as for people with disabilities. The vast majority of low-income travelers would be accessing the area by other modes and would benefit significantly from expanded, faster, and more reliable transit, as well as better walking and bicycling infrastructure.

SFCTA is also moving forward with another tolling strategy for Treasure Island, an ex-naval base in the middle of San Francisco Bay. Massive development is proposed for the island, even though the only way to *drive* on and off the island is via the heavily congested Bay Bridge. SFCTA plans to charge all vehicles coming onto Treasure Island beginning in 2021. Details of their equity strategy for the project are described in the next chapter.

Vancouver has been exploring regional congestion pricing on its roadways through a careful and deliberate process. To date, this process has identified two potential road pricing alternatives for further consideration—distance-based charges and congestion point charges, the latter a form of cordon pricing.

Three overarching objectives are guiding their process: reducing traffic congestion, promoting fairness, and supporting transportation investment. Equity considerations are embedded in the principle of promoting fairness and have been a primary part of the planning process from the beginning. Impacts on vulnerable communities are among the core issues being addressed, including estimating the level of revenues that would need to be reinvested in low-income communities so that the pricing element of any plan would not be regressive.

Seattle is exploring the use of pricing to reduce congestion, address climate change goals, and generate new revenues. At the same time, the City of Seattle has embraced equity as central to transportation planning, having established a Transportation Equity Program in 2017. This program "provides safe, environmentally sustainable, accessible, and affordable transportation options that support communities of color, low-income communities, immigrant and refugee communities, people with disabilities, people experiencing homelessness or housing insecurity, LGTBQ people, women and girls, youth, and seniors..."[30]

Funded through the Seattle Transportation Benefits District, the Transportation Equity Program allocates up to $2 million annually to support equity programs, including:

- Subsidized transit passes;
- Youth transit passes;
- Partial rebate on vehicle licensing fees;
- Discounted car-share memberships and driving minutes; and
- Ongoing community consultation.

Funding from a road pricing project could be used to help maintain or expand these programs, as well as enhance transit services.

CHAPTER 3

Achieving Equitable Outcomes

Defining equity outcomes

To understand how road pricing strategies can drive an equity agenda, the desired outcomes need to be clearly understood. There are dozens of papers describing different types of equity outcomes in relation to congestion pricing.[31] These include overall ideas of fairness, such as by geography, not just those related to vulnerable communities. ***This report focuses on two dimensions of equity: Process Equity and Outcome Equity.***

For **Process Equity***,* the key measure is the full participation of vulnerable communities in planning, implementation, and project follow-up. Process Equity is central to the long-term task of making transportation systems more equitable for all people while addressing *historical inequities* that continue to affect vulnerable communities. For **Outcome Equity***,* TransForm identifies three key measures: affordability, access to opportunities, and community health. Step #2 of the Toolkit has more detailed explanations of each measure as well as sample indicators for each.

Type of Equity:	*Key Measures:*
Process Equity	Full Participation
Outcome Equity	Affordability
	Access to Opportunity
	Community Health

This chapter lists sample strategies for each of these four measures. Many of these examples are taken from existing pricing programs, while others could easily be introduced as part of a pricing program. The solutions for each city and region may vary based on community engagement and a detailed assessment of the affected communities.

Some of the most relevant strategies may have been identified previously in local or regional plans, or in recommendations made by community groups for other projects; a road pricing project can become the means to implement and fund promising strategies.

Step 4 of the toolkit goes into greater detail on ways to measure each of these four outcomes with specific performance indicators.

Full participation

There are countless resources available for supporting strong public participation from vulnerable communities. The chart below indicates the kinds of participation efforts that are more or less likely to empower communities.

Increasing Degree of Participation[32] →					
Level	**Minimal** ⟷				**Optimal**
Public Participation Goal	Vulnerable Communities are provided information on the project.	Vulnerable Communities provide feedback to the goals.	Solicitation of public concerns and aspirations is ongoing	Agencies closely partner with community groups throughout the project.	Vulnerable communities have a seat at the decision-making table.
Sample Outreach Strategies	• Fact sheets • Websites • Open houses	• Public meetings • Public comment • Focus groups • Surveys	• Workshops • Deliberative polling	• Advisory committees comprised of residents • Consensus building • Participatory decision-making	• Citizen juries • Ballots • Delegated decisions • Formal representation on decision-making groups

The expectations for the level of engagement are somewhat different for different pricing proposals. HOT lanes seem to get the least scrutiny and carry the lowest expectations. This may be because drivers can opt to use the free lanes some or all of the time, and because carpooling, vanpooling, and transit are not charged for entering the lanes.

For cordon or area pricing proposals—like those described above for San Francisco, NYC and Seattle—the bar is typically very high. In part this is because city leaders and residents have long expressed concerns about equity. But cordon pricing is still a new and untested concept in the U.S., so there are no domestic examples of its benefits or real-world impact on affordability, once mitigation measures are fully implemented.

For cities and agencies engaged in pricing studies, an important consideration is the degree to which they've already developed an effective approach to operationalizing equity in community participation processes. These measures include:

- Having equity experts on staff;
- Developing or adopting general racial and social equity tools;

- Training staff in equity issues and processes; and
- Contracting with members of vulnerable communities as consultants in community participation work.

A major concern with achieving full participation is ensuring that representatives from vulnerable communities are present *from the beginning* on project advisory boards, sharing local knowledge and concerns. Their input is vital at the earliest stages of project visioning to help determine equity needs and community desires and concerns, as well as to identify metrics to help determine project success.

Vancouver: Community engagement around outcomes and indicators. In exploring the use of road pricing in the metro Vancouver region, the Mobility Pricing Independent Commission engaged in extensive community consultation, making a notable effort to reach out to vulnerable communities (see graphic below). Their engagement identified a number of issues related to equity concerns with road pricing, including the need for improved infrastructure for transit and safe bicycling and walking; finding equitable ways to mitigate impacts on seniors, lower income, and/or differently abled people; providing discounted transit fares; and general affordability concerns.[33]

Vancouver's Mobility Pricing Study Public Participation Results[34]

- Conducted **2** rounds of public opinion polling in September 2017 and March 2018 with **2,000** residents across the region
- Launched **2** multilingual public education campaigns on the Commission's work and mobility pricing in the region in **16** local distribution and **11** non-English newspapers and reaching **898,099** residents on Facebook and **65,752** website page-views
- Conducted online public engagement and in-person workshops to inform the principles, hearing from **6,078** residents and **176** stakeholders and government officials in Phase 1 and hearing from **11,474** residents and **130** stakeholders in Phase 2
- Increased accessibility by translating the online platforms into Traditional Chinese, Simplified Chinese, and Punjabi (the region's largest non-dominant languages), receiving **310** completed paper surveys from over **16** regional community offices, and conducting outreach with social service organizations
- Convened a citizen-based User Advisory Panel of **15** members representative of Metro Vancouver (selected through an external recruitment firm) to advise and provide input at key stages of the project

New York City DOT: Street Ambassadors Program. The New York City Department of Transportation created its Street Ambassadors Program to help improve process equity in its planning efforts by stimulating broader public participation in the planning process. Street

Ambassadors are recruited through external temporary employment programs that support the "diversity pipeline" in order to bring in a range of language skills and cultural backgrounds.[35]

The program was designed to be:

- *Equitable*, by intentionally hearing from as many affected people as possible, actively seeking out underrepresented groups, and speaking with them in multiple languages;
- *Flexible*, by meeting people where they were, including at rush hour, in the evenings, and on weekends; and
- *Respectful*, by honoring people's time and not making people go out of their way to participate.

As a measure of the success of the program, in 2016 the program supported 82 street improvement projects with over 32,000 conversations with the public.[36]

TransForm's companion Equity Toolkit has a section on full participation that includes indicators to show whether the program is achieving strong participation.

Affordability

At the heart of the affordability question is: Will the proposed pricing project make transportation *more expensive* for some members of vulnerable communities, and by how much*? **It is just as important, however, to ask if there are ways transportation can be made more*** **affordable** ***through such projects.***

How can road pricing make transportation more affordable, when it seemingly adds a new expense? There are several ways.

- Unlike sales taxes, fuel taxes, and many other *regressive* sources of revenue, pricing programs can offer means-based affordability options that reduce costs for low-income drivers. Sample strategies for this are described below under "Subsidies, discounts, caps, and exemptions for drivers."

- Pricing programs can also provide lower cost options or subsidies and discounts for people who are already using alternatives (for example, by distributing free or discounted transit passes). Sample strategies for this are described below under "Affordability for transit riders and other mobility options" and "Bike share discounts."

- Finally, an improved set of alternative choices— funded by pricing revenues or simply by speeding up public transit rides—may reduce the need for vehicle ownership for some people, allowing them to save money on gas, car maintenance, and parking.

One way to understand impacts on affordability is to look at *overall* household expenditures on transportation. What percent of a household's income goes to all transportation expenses? The Oakland-based Greenlining Institute, in its *Mobility Equity Framework*, recommends a general

target that households in vulnerable communities devote no more than 20% of their income to transportation.[37] This figure will necessarily vary by region/city, but is a good starting point.

Subsidies, discounts, caps, and exemptions for drivers

The most direct way to mitigate the cost of a pricing program on low-income drivers is to consider a range of subsidies, discounts, credits, caps (the maximum amount that someone might need to pay, usually over a certain period of time), and toll exemptions. While these may benefit those drivers, such discounts, caps, and exemptions need to be carefully weighed against other program goals such as moving traffic more efficiently or reducing greenhouse gas emissions. It is essential to define, up-front, the process for identifying and harmonizing these potential conflicts, including programs to transparently monitor, evaluate, and adjust program elements to ensure that all goals are met.

Some planners have proposed comprehensive transportation subsidies, applicable not only for driving fees or tolls, but for transit and other sustainable options as well. Sometimes referred to as a “mobility wallet,” these subsidies could address equity without creating an incentive to drive. While the concept may face implementation hurdles it is worth pursuing as a way to achieve both equity and efficiency outcomes.

Usually, a single threshold is set to qualify for discounts, but it doesn’t need to be that way. A Seattle focus group in 2014 suggested tolling should be different for drivers under 30% AMI (Annual Median Income) and those earning 30-60% AMI, to maximize benefits.[38] The following are two examples of existing programs and two that are proposed.

Los Angeles: Transponder Credits. L.A. Metro provides a one-time $25 transponder credit and waives the monthly maintenance fee for L.A. county residents who fall below an income threshold (about twice the Federal Poverty Level).[39] Their transit rewards program, the first of its kind, gives transit riders a $5 credit to use the express lanes for every 16 transit trips during peak hours using the I-10 El Monte Busway or I-110 Harbor Transitway.[40]

London: Exemptions. London offers various discounts and exemptions to disabled drivers. Notably, the London congestion charge includes a ‘Blue Badge Program’ for drivers with disabilities, which offers a 100 percent discount to them and those driving them. Participants may register up to two vehicles in the program.[41] Refunds are also available for certain people traveling to hospital appointments.[42]

In order to make the congestion charge more politically acceptable, the transportation authority offered many different exemptions. For instance, residents within the charging zone received a 90 percent discount, and there were exemptions for alternative fuel vehicles.[43] The number of exemptions has muted the traffic and emissions reduction benefits, especially as ride hailing services grow. As a result, London has been reviewing and restructuring some of these benefits.

New York City: Caps on Tolls. The Move NY cordon pricing program proposed a cap on tolls for small businesses, essentially permitting multiple crossings of the cordon line in any given day

after the first toll is paid. With the expected reduction in traffic delays, it is estimated that the average business could add an additional two to three deliveries or service calls per day.[44]

San Francisco: Treasure Island Transportation Affordability Program. Beginning in 2021, SFCTA will implement a program that has many characteristics of a cordon price. The Treasure Island Mobility Management Program merges the concepts of cordon pricing and road tolling by charging all vehicles that drive onto Treasure Island, a former naval station that is being redeveloped.[45] The program, to be funded in part by the tolls, will provide new residents of Below-Market Rate (BMR) units a discount on a variety of modes through a multimodal Transportation Affordability Program (TAP), which includes transit and car-sharing. Combined with new or improved transit services and lower transit costs, the program is expected to benefit many more residents than a toll credit of any kind. Longtime households and existing BMR residents would also receive one non-tolled daily round-trip (or an equivalent TAP benefit) until July 2026.[46] The program is expected to both reduce costs and improve mobility for low-income residents of the island, while also reducing congestion, air pollution, and time spent driving.

Affordability for transit riders and other mobility options

New York City Fair Fares. Means-based fare reductions were proposed as part of the Move NY program in 2015. Implementation started in January 2019, even though the rest of the program has yet to be approved. The program offers half-priced MetroCard transit passes for city residents whose incomes are below the Federal Poverty Line, potentially covering up to 800,000 New Yorkers.[47]

Seattle ORCA fares*.* After passing a Transportation Equity Resolution, Seattle adopted a number of programs to increase transportation access and equity. Seattle built on the already-established King County ORCA Lift program, which offered half-price transit fares for those who qualify based on income, with the ORCA Opportunity program, providing free, unlimited transit for high school students, income-qualified middle school students at Seattle Public Schools, and Seattle Promise Scholars.[48] Finally, Seattle is starting a low-income car-share program to provide income-eligible residents with discounted car share memberships and driving minutes.[49] While currently funded through other sources, many of these equity programs could be funded through a congestion pricing plan. Places like Seattle that already have such programs in place can more readily expand or deepen them with funds from congestion pricing.

Bike share discounts

As bike share increases in reach and popularity, discounted and improved bike share programs can be an important benefit to vulnerable communities that may be funded, at least in part, through congestion pricing revenues. Bikeshare isn't just an alternative mode on its own; it can be an important element of a transit program, offering people a convenient "first mile/last mile" solution for accessing transit from beyond a comfortable walking distance, extending the reach of a station significantly.

Chicago's bike share program, Divvy, provides a $5 annual membership that allows for cash payment for Chicago residents below 300% of the Federal Poverty Line. The cost goes up every year, reaching a $75 annual membership in year four. Members can add money to their account using cash at participating 7-Eleven, CVS, and Family Dollar stores.[50]

In the Bay Area, a similar Bike Share for All discount, combined with a regionally coordinated equity outreach program, helped increase the number of low-income members from 3% to 20% in the span of a year.[51]

The City of Portland, Oregon, offers highly discounted rates on its bike share program. Low-income residents who qualify can purchase a monthly pass under the Biketown-for-All program for just $3/month (with the first month free), compared to the standard fee of $19/month. Low-income residents can further earn credits to reduce their out-of-pocket costs to zero.[52]

Vancouver, British Columbia, has recently launched its "Vancity Community Pass" bike share program for low-income residents, offering a year of bicycle access for just $20. Qualification piggybacks off other low-income passes, including those offered through the transit agency and community centers, as well as third party referrals from partner organizations, and no credit card is required.[53]

Access to opportunity

Transportation affordability is a central issue, but just as critical of an issue is *access*—can people get to the many and diverse places they need or want to go?

Transportation systems should connect people to *opportunities*, including employment sites, retail centers, medical services, recreational destinations, schools and libraries, social services, friends and family, gathering spots, places of worship, and entertainment sites. When someone enjoys better access, they can get to more potential jobs, as well as to stores offering a broader range of relevant goods and/or cheaper prices, educational and recreational opportunities, etc. When access is limited, people may find fewer jobs within reach, their retail options may be more limited and expensive, and they might incur greater expense, both in time and money, to access important destinations.

A transportation system looking to improve equitable outcomes must provide greater access to opportunities for low-income households and members of historically marginalized groups. This should go beyond road pricing or any specific project to encompass the entirety of the transportation system. Equity advocates should be thinking in terms of an overall strategy to address transportation equity in which road pricing plays a role; beyond the direct impacts of pricing, the potential revenue from a pricing program can help fund (in a more equitable manner) a better mix of transportation services.

Bus users, for example, are some of the biggest winners from congestion pricing in London and Stockholm. Both cities increased the number of buses in advance of implementing cordon or area charges, increasing accessibility. In central London, bus wait times fell by 30% and delays

due to traffic congestion fell by 60%.[54] In New York City, a recent study suggests that congestion charging would provide significant time savings to riders of express buses.[55]

Los Angeles uses revenues from its Metro ExpressLanes to fund a range of improvements, including express transit routes, commuter routes, and walking and bicycling projects, all targeted within three miles of the two existing ExpressLanes.[56] The transit routes improve access for residents of the corridor to reach major employment centers. Los Angeles is also considering the use of revenues from the ExpressLanes to help convert lanes on additional freeways to express operations.

Twin Cities. Minnesota state legislation requires that one-half of "remaining" money generated through tolled express lanes be dedicated to the expansion and improvement of bus transit services in the related corridors.[57]

Pierce County Transit and Lyft. Ride-hailing services like Lyft and Uber have increasingly started to work with transit agencies to help improve access to and from transit, often referred to as "first- and last-mile solutions." These services could help provide connections to residents of suburban and rural areas who would otherwise have the hardest time accessing public transportation.

Washington's Pierce College Puyallup, for example, partnered with Pierce County Transit and Lyft to bridge first-last miles gaps to both bus and light rail stations. In addition, the project will also provide students at Pierce College Puyallup a grant-funded Lyft ride home from some locations near campus in the evening after transit services have ended. This program demonstrates that there is no one-sized fits all solution, and that creativity is needed to serve a wider range of people that would otherwise be largely car-dependent.[58]

Lyft also recently started working directly through community groups to give qualifying members free-rides.[59] This could help in areas not well served by public transit.

Making sure tolled facilities are accessible

Road pricing programs often assume that people will have the ability to use the priced roads or the transit options, discounts etc. Electronic tolling and transit cards make it efficient to use those facilities, but only if one has the resources to participate. Such systems often depend on:

- *Transponders* that automate the toll collection process;
- *Credit cards* that may be tied to transponders or accounts;
- *Languages* required to understand instructions;
- *Bank accounts* that may be tied to transponders or accounts; and
- *Smartphones* that run the apps used for some services (such as shared rides).

Since many low-income households may not have bank accounts or credit cards, be able to afford the initial deposit on a transponder, or be sufficiently fluent in English, they might not be

able to take advantage of either the newly tolled facility or many of the alternatives. It is critical to overcome these barriers (the Los Angeles program described in this report is an example).

All of the examples in this chapter raise the question as to *where and how* the decisions about road pricing programs are made. The answer varies by locale; a good guide to the types of decisions and requirements that apply to different governmental agencies and stakeholders may be found in the National Cooperative Highway Research Program's *Assessing the Environmental Justice Effects of Toll Implementation or Rate Changes: Guidebook and Toolbox*.[60]

Community health

Transportation systems too often impose negative health impacts on vulnerable communities. Major roads and freeways are often built in or adjacent to such communities, subjecting them to higher levels of air pollution and the various serious health problems that accompany it. Projects that end up increasing road traffic in vulnerable communities also increase safety hazards for pedestrians and bicyclists. Chronic disinvestment in these communities often means that likely destinations are not within safe walking distance, limiting physical activity and increasing emissions, contributing further to negative health outcomes.

Healthy communities are a clear and major equity goal. Road pricing should reduce overall driving and result in improved air quality when effectively implemented. A clear-cut example of improvements in air quality comes from Sweden, where a Johns Hopkins study found that improvements in air quality in the central zone due to reduced traffic led to a 50% decrease in asthma attacks among young children.[61]

Funding can go to clean air buses as well as improved conditions for walking and bicycling. Even though community health benefits are likely, it is important to analyze the potential (and actual) diversion of traffic so that vulnerable communities do not see an increase in traffic.

Los Angeles: Clean Air Buses. Purchased in part with $1.4 million from the Metro ExpressLanes program, Foothill Transit in L.A. recently acquired two double-decker electric buses. The buses can hold up to 80 passengers and provide a quieter, less bumpy ride than traditional articulated buses, while reducing GHG emissions by 80-90% compared to diesel buses.[62] L.A. has also invested revenues in bicycle and pedestrian infrastructure along the corridor.

King County, Washington: Prioritizing clean air buses for vulnerable communities. In March 2017, King County Metro released a feasibility plan to achieve a zero-emission fleet. The goals included climate and racial and social equity objectives. The report adopted a methodology for identifying the areas with the greatest vulnerabilities based on air quality, health, and social conditions (such as demographics, linguistic isolation, and rates of high school completion). The analysis revealed where zero-emission bus routes would have the greatest positive impact on equity. The results were meant to both inform near-term decisions and provide an analytic framework that could be used in the future. Since most pricing programs will direct revenues to expanding and potentially cleaning the bus fleet, this methodology provides a strong example of how to maximize equity and health benefits.[63]

CHAPTER 4

Putting It All Together

Equitable pricing can support equitable transportation

This report has outlined many possibilities to work with impacted and vulnerable communities to design systems that make transportation more fast, affordable, and healthy than it is today. So why do road pricing strategies, especially congestion pricing in downtowns, often fail based on concerns about social equity? There are many reasons, including the many layers of decision-making and approvals that are needed to plan and implement pricing strategies. The authors believe there are at least two fundamental reasons worth understanding.

First, is the lack of a single shining example of road pricing. That is why our implementation strategies do not highlight just one region, and why the report pulls ideas from places that are implementing pricing as well as some which are considering doing so.

The second is suggested by Professor Michael Manville of UCLA's Department of Urban Planning: that we have a strong human tendency to strictly scrutinize the potential implication of changes.[64] Changes are noticeable and they require an act of commission. The status quo of free roads, with all of their inefficiencies, congestion, and pollution that disproportionately harms vulnerable communities, persist with little or no scrutiny—that's the privilege of the status quo. The failure to act (omission) carries less weight than acts of commission. As a result, people strictly scrutinize harms that arise from changing the status quo, and downplay or overlook harms that arise from the status quo itself.

To counter that, Professor Manville posits a future where all freeways are priced:

> Maybe the best way to think about congestion pricing's fairness is to imagine a world where the roads are already priced—a world where we allocate road space like we already allocate water or electricity or other infrastructure. In this world, drivers would pay for the valuable public land they used; congestion would be far lower and so would pollution; transit would run faster; and governments would use some of the toll revenue to mitigate congestion pricing's burden on low-income drivers.
>
> Now imagine a proposal to make all roads free. Free roads would let the poor and rich drive free, but the rich drive much more than the poor. Congestion would rise, buses would slow, and pollution would increase. The pollution would fall most heavily on the poor, but without tolls, there would be no revenue to redistribute and compensate the people it fell on. Making the roads free would undermine efficiency (the transportation system would work less well) and equity (free roads would harm the disadvantaged and reward the more advantaged).

> In the real world, this unequal proposal is not a proposal at all. It's the status quo, and its normalcy prevents us from thinking about its fairness. It is appropriate to worry that priced roads might harm the poor while helping the rich. But we should also worry that free roads do the same, and think about which form of unfairness we are best able to mitigate. People who worry about harms to the poor when roads are priced, and not when roads are free, may be worried more about the prices than the poor.[65]

We don't yet live in that future where widespread road pricing promotes equity and sustainability. But it is not far-fetched. In both London and Stockholm, pricing was not popular when first proposed. Once people experienced the benefits, including transit riders who got expanded service and faster rides, pricing became an accepted—even popular—and necessary component of the transportation system. Pricing policies and levels need to be continuously evaluated and updated, but they are not going away.

While road pricing is not a panacea, it can be an important piece of the transportation equity puzzle. If we listen to community voices, engage community expertise, and work collaboratively to develop more affordable, accessible, and healthy transportation options, road pricing can contribute to a more just, sustainable world where everyone has the opportunity to thrive.

Pricing and investment strategies: equity impacts

We can sum up the general impacts on equity of a variety of pricing and investment strategies. The following two charts should be useful as a means of understanding the relative impacts of different alternatives.

PRICING STRATEGY EQUITY MATRIX

PRICING STRATEGY	*EQUITY IMPACTS*
24 hour **Flat-rate pricing**	Likely to be most regressive strategy, charging low-income drivers who often don't commute at peak commute hours. Least efficient at reducing congestion. Used on many tolled facilities.
Dynamic pricing varies with time or congestion	Efficient charging system but may be regressive (though likely less regressive than gas and sales taxes).
Dynamic pricing with some means-based discounts or rebates	Less regressive due to discounts.
Means-based pricing with targeted caps and/or exemptions	System designed specifically not to be regressive. Some loss of efficiency as plentiful discounts, caps and exemptions may limit the congestion and climate benefits.

REVENUE INVESTMENT EQUITY MATRIX	
INVESTMENT STRATEGY	***EQUITY IMPACTS***
Road expansion	Does not add more affordable options.
Mix of road expansion and transit	Some drivers can shift to new, more affordable modes. Transit users also benefit.
Transit, walking, and bike infrastructure with targeted carpool, vanpool, and new mobility options where needed	Allows greater shift to more affordable and sustainable modes.
Transit, walking, and bike infrastructure with an **intensive focus on vulnerable communities**	Significant expansion of commute options and a reduction in user costs (if fares are reduced on transit and other mobility options).

Five steps to equitable outcomes: TransForm's companion toolkit

While this report is the "why," the toolkit that accompanies this report is the "how." It lays out a roadmap of five primary steps to help ensure that road pricing studies improve the equitability of the transportation system.

1. Identify Who, What, and Where
2. Choose Equity Outcome and Performance Indicators
3. Determine Benefits and Burdens
4. Devise Programs to Advance Transportation Equity
5. Provide Accountable Feedback and Evaluation

With several cities and regions considering progressive programs, this is an important time for policymakers and equity advocates engage in road pricing studies to see if we can use road pricing as tool to advance racial and social equity. The toolkit lays out a process for fulfilling this vision.

Notes

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TransForm

Our communities. Our transportation. Our future.

A Companion Toolkit to the *Pricing Roads, Advancing Equity* Report

TOOLKIT

PRICING **ROADS,** ADVANCING **EQUITY**

EQUITY TOOLKIT

Contents

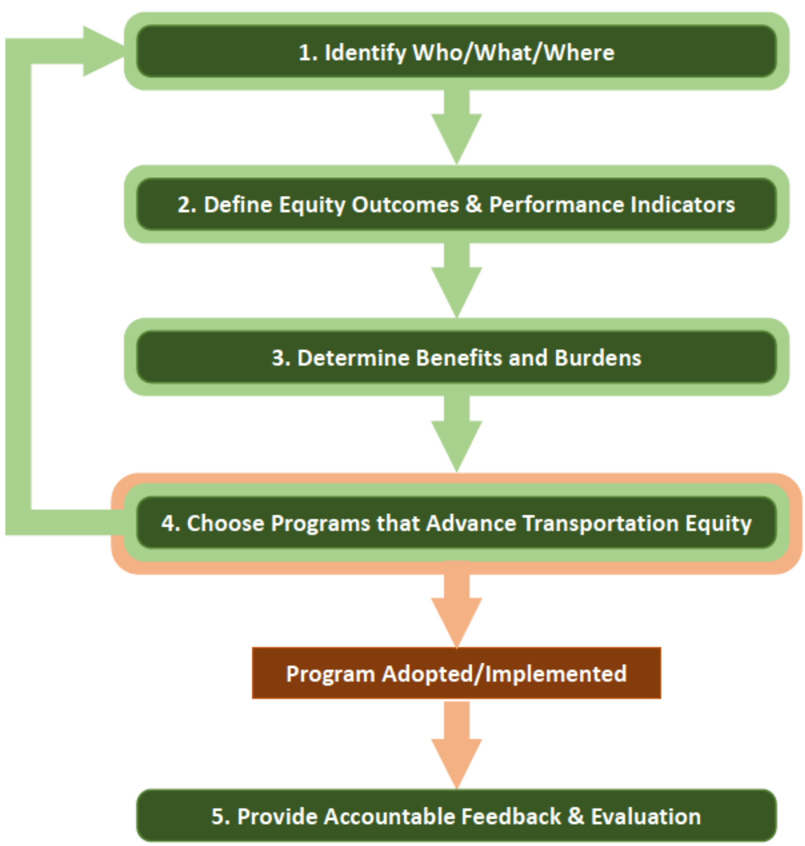
EQUITY TOOLKIT

Introduction

Five Steps Toward Equitable Outcomes

TransForm's report, *Pricing Roads, Advancing Equity,* suggests that road pricing strategies have the potential to produce notable benefits for vulnerable communities by addressing historic inequities (such as slow, infrequent, and unreliable bus transit). For these benefits to happen it is important to develop a clear sense of what a more equitable system might look like and then understand how a road pricing project can help get our communities closer to that system.

This toolkit is designed to help both equity advocates and decision-makers better understand how to effectively engage at key steps in the planning process. The toolkit is built on five *iterative* steps that form a conceptual framework, as shown in graphic below.



As a pricing and investment strategy advances it will be necessary to revisit earlier steps. For example, once a comprehensive strategy emerges from Step #4, it will be necessary to test it against the three earlier steps with an eye to further *refining* and *optimizing* the program along key indicators. In some cases, especially with cordon or area pricing proposals, as many as 5-10 iterations may be required to arrive at a solution worth implementing.[1] For HOT lanes and similar projects, fewer iterations are typical.

Strong participation and deep engagement from the most vulnerable communities is critical throughout the process, from inception through implementation and beyond. That's why this toolkit does not have a stand-alone step for "public participation." Indeed, the focus of the toolkit is to support equity advocates and decision-makers in achieving full participation at each step. Equity advocates can help planners reach vulnerable communities by helping develop the Public Participation Plan component of the study, which is discussed in greater detail in this toolkit's companion report. Equity advocates should ensure that representatives of vulnerable communities are incorporated at every phase of a road pricing project.

An excellent guidebook and toolbox for planners that are leading road pricing studies is the National Cooperative Highway Research Program's (NCHRP), *Assessing the Environmental Justice Effects of Toll Implementation or Rate Changes.* With an intended audience of practitioners such as agency staff and consultants, the document is long and can be quite technical. Yet it has many excellent examples of where a particular tool, analysis, or strategy has been used to help advance equity.[2]

NCHRP's Tool #4, "Preparing, Implementing, and Assessing a Public Involvement Plan," for example, has a useful table with strategies that can address challenges to participation. While many of these strategies may be obvious to community members, they may not be as obvious to planners and other public officials. It can very useful to delineate these strategies in chart form to help create a common template for advocates and project planners to walk through ideas for the Public Involvement Plan.

Since we encourage equity advocates that dive deep into planning to reference the NCHRP guide, it is important to know how TransForm's five steps line up with the steps they propose. The following chart shows TransForm's five steps and how they correspond with steps in the NCHRP guidebook.

TransForm's Five Steps		NCHRP Planning Steps
1. Identify Who, What, and Where	➔	1. Frame the Project 2. Identify the Applicable Requirements Governing Decisions 3. Recognize the Relevant Decision-Makers and Stakeholders

2. Define Equity Outcome and Performance Indicators	➔	4. Scope Approach to Measure and Address Impacts
3. Determine Benefits and Burdens	➔	5. Conduct Impact Analysis and Measurement
4. Choose Programs that Advance Transportation Equity	➔	6. Identify and Assess Mitigation Strategies
5. Provide Accountable Feedback and Evaluation	➔	7. Document Results for Decision-Makers and the Public 8. Conduct Post-Implementation Monitoring

For road pricing projects, the agencies leading the studies should consult both TransForm's Toolkit and NCHRP's. The "additional resources" box at the end of each of TransForm's five steps can help with that deeper dive.

Format of the Toolkit

For each of the five steps outlined above, the toolkit has five components:

- Purpose
- Discussion
- Case studies or example (where appropriate)
- Questions to ask
- Additional resources

In addition, worksheet templates for recording your answers to the questions may be downloaded from www.transformca.org.

To make it easier to flip through to a specific component, the toolkit has color-coded text boxes, as follows.

CASE STUDIES	Case studies are displayed on a light blue background.
QUESTIONS TO ASK	Questions to consider asking are listed on a light pink background.
ADDITIONAL RESOURCES	Additional resources are described on a light green background.

EQUITY TOOLKIT

Step #1

Identify Who, What, and Where

Purpose

The early stages of a pricing equity study are where several key decisions are made, namely:

***Who*?**	The *populations* that need to be considered from an equity perspective.
***What*?**	The type and nature of *pricing* to be considered, along with any viable alternatives.
***Where*?**	The *geographic reach* of the study area, including key destination types such as medical facilities.

In planning terms, this stage is where the study's *scope* is developed.

Discussion

Who: Populations to be Studied

Any equity study is required to look at the impacts of major transportation projects on vulnerable populations—low-income communities and minorities. Under US Federal guidelines, *minority* populations include Black, Hispanic or Latino of any race, Asian American, American Indian and Alaskan Native, Native Hawaiian, and Other Pacific Islanders. It also includes individuals with limited English proficiency of any race. Low-income populations are any whose household incomes are at or below Federal poverty guidelines, though since federal thresholds are so low advocates may seek higher poverty thresholds for purposes of a pricing study.

From an equity perspective, it is often important to consider other vulnerable populations such as seniors, persons with disabilities, immigrants and refugees, local small businesses, and even services like non-profit meal delivery services.

Federal policies also outline the fundamental principles of Environmental Justice:[3]

- To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.

- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.

A key first step is to identify the data sources that can give you the demographic characteristics of the populations in the study area, and to parse this demographic data at different geographic scales. To start with, check if the regional planning agencies, county, or city may already have produced maps and datasets identifying communities of concern and travel patterns. Another first stop will be census data.

These sources all have limitations. They may be supplemented with a survey of key transportation destinations, such as schools, hospitals, and senior centers. In addition, it is critical to tap into local knowledge through interviews with community leaders, focus groups with residents, and possibly surveys to understand community concerns and travel patterns.

One of the key issues is what minimum population size merits an analysis of impacts. It is often typical, for example, for agencies to focus on census block groups (all urbanized regions in the U.S. are divided into these units) in which at least 50% of residents are low-income or minority. In areas that have a large percentage of minority residents, the 50% threshold may not be as useful, so agencies can use a “meaningfully greater” threshold to identify areas that have greater concentrations relative to the surrounding communities or region. In some cases, it might be useful to create an index that assigns points based on several criteria in order to select the zones that score highest on the combined criteria, such as was done in Dallas/Forth Worth.[4]

The population frame of reference can have a notable impact on the predicted outcomes. For example, the standard practice for estimating *regressivity* in road pricing projects looks at the toll’s potential impact only on households with workers who would drive on those tolled facilities. One study made this estimation for the Puget Sound region of Washington State and found the toll to be quite regressive. If the study looked at all commuters (e.g. transit riders), not just those who paid the toll, it was less regressive. When the analysis was extended to the whole population, whether or not they commuted, regressivity fell even further.[5]

None of these levels of analysis is right or wrong by itself. Rather, it depends on the question you are trying to answer. If you want to study discount or exemption programs—how much they would cost and how they might be structured—then you need to focus on likely users of the tolled facility or zone. If you are trying to understand whether pricing would be less regressive than other funding mechanisms like sales or property taxes that are distributed across the whole population, then this broader analysis of the toll’s cost is the correct reference.

Any community can have environmental justice concerns, even if they don’t meet a given threshold. The NCHRP provides guidance that environmental justice determinations are made

based on effects, not population size.[6] Page 95 of that guide also has an excellent table outlining the various methods to get data about populations.

QUESTIONS TO ASK:	
1.1	**Are all populations adequately addressed in the study?** *Should priority be given to certain populations? Why?*
1.2	**Does the way groups are defined capture all relevant people?**
1.3	**Are the criteria used to identify groups fair and accurate?** *For example, does the measure of household income adequately capture the target population? In some metro areas households earning up to twice the Federal poverty level may still be economically disadvantaged and in need of more equitable policies.*

CASE STUDY Los Angeles[7]

In framing the objectives of its study of the impact of freeway HOT lanes on low-income populations, Metro (the L.A. transportation agency) chose as its primary focus "group equity"—ensuring that low-income commuters as a group are not being disadvantaged by the toll lanes by mitigating any excessive burdens. Additionally, Metro noted its concern for "market equity"—ensuring that shares of benefit are in proportion to the charges paid *because the financial burden of tolls should not exceed the value of travel time savings.*

Metro first described how "low-income" was defined. Then, using four distinct methods to understand the potential range of outcomes, they estimated the likely demand for the ExpressLane corridors by low-income commuters.

The authorizing legislation (SB 1422) explicitly mandated that eligibility requirements for "low-income" toll credits be set at a level no lower than five other referenced state and local programs serving the needs of low-income populations. In response to this requirement, Metro compared existing eligibility thresholds set by these programs and benchmarked other Los Angeles County programs, planned or in use, such as the Metro Rider Relief Program for low-income transit users.

Following this review, Metro set a threshold of $35,000 (in 2009 dollars) based on an annual income for a household of three persons, which was double the federal poverty level.

What: The Proposal and Viable Alternatives

Like with many transportation studies, road pricing studies may begin with a specific "favored" proposal, such as building a toll lane or converting an HOV lane to HOT. The projected *impacts* of this proposal are then compared with the projected impacts of one or more alternatives, as well as a scenario in which no action is taken.

Some highway widening studies may put road expansion into each of the alternatives (except the "no action" scenario). Like with the Portland and Bay Area examples in Chapter 2 of this toolkit's companion report, a road pricing alternative can be used as a way to question the assumption that widening is required, and whether a "no widening" alternative can better meet *both* transportation and equity goals.

In other cases, a large number of mechanisms could be considered from the beginning. This is especially true when congestion pricing is being considered for downtowns and the areas surrounding them. The following table, derived from one created for Seattle's current congestion pricing study, is a useful summation of a number of pricing tools that may be considered.

Pricing Tools Summary

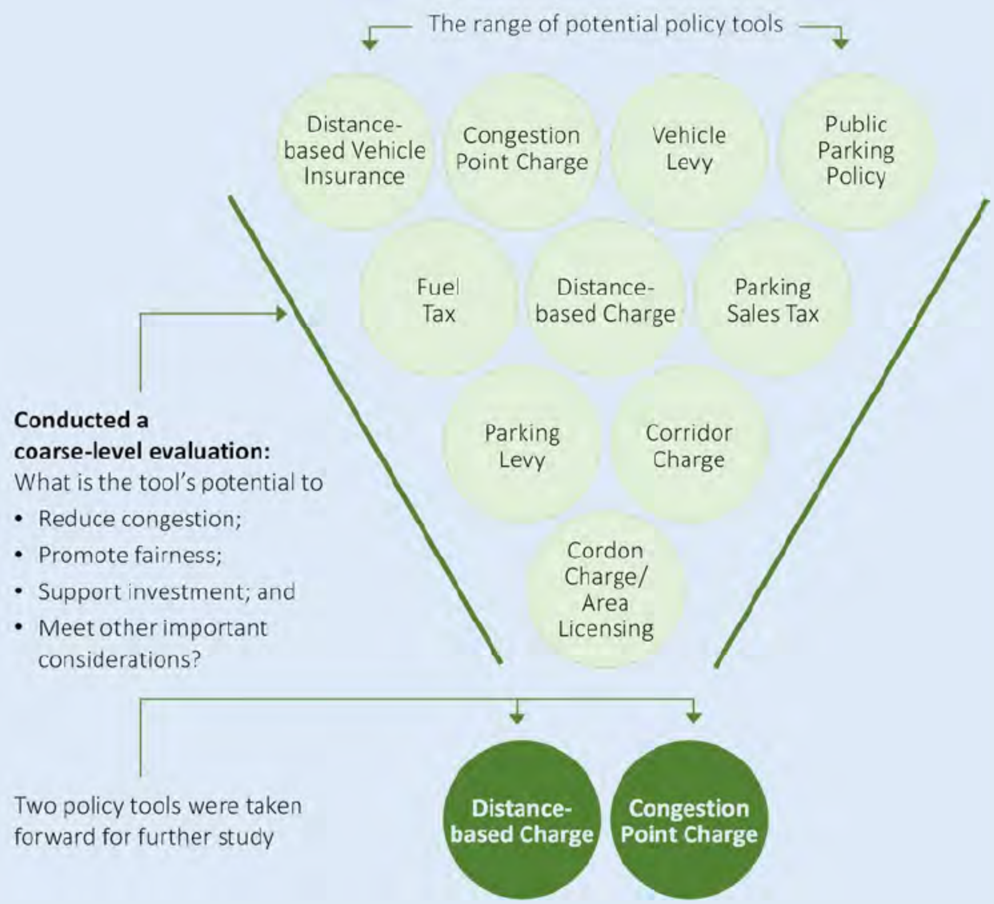
PRICING TOOL:	DESCRIPTION:
Cordon Pricing	Charge vehicles crossing the boundary into a cordon pricing zone.
Area Pricing	Charge vehicles crossing the boundary into *as well as driving within* an area pricing zone.
Fleet Pricing	Apply targeted pricing to specific vehicle types entering a zone, such as ride-hailing fleets or commercial vehicles.
Road User Charge (RUC)	Restrict access to a zone to vehicles enrolled in an RUC program that replaces fuel taxes with payment per mile traveled.
Arterial Toll Roads	Price entire arterial road(s).
Arterial Express Lanes	Convert or add lanes on arterial roads as tolled lanes, such as by converting bus-only lanes or an existing general-purpose lane.
On-Street Parking Pricing	Vary street parking prices to control demand.
Off-Street Parking Pricing	Apply a fee/tax to off-street parking facilities.
Vehicle Occupancy (HOT)	"High Occupancy Toll" lanes give free or discounted access to vehicles carrying a specified number of people (2 or 3 is typical), while charging a toll to all others.

During the first step, or at least after going through the first three steps, it is possible that the types of pricing to be studied are narrowed down to a manageable number by conducting an initial screening of the impacts and benefits of the options. The most promising options will then be subject to a more detailed analysis.

This is illustrated by the process Vancouver, British Columbia, is employing, as described in the case study below.

CASE STUDY Vancouver[8]

Vancouver has mounting congestion, continued population growth, and two bridges that are tolled while others are not, leading to concerns about the fairness of the system. While some type of bridge tolling or congestion charging seemed a likely outcome, Vancouver created an Independent Pricing Commission that studied a broad range of alternatives. They first adopted a set of transportation goals which included promoting fairness in transportation costs and impacts. They then evaluated which alternatives, if any, could best achieve their goals. After detailed analysis and community input, they settled on the two potential alternatives that seemed to be the best fit: distance-based charges and congestion point charges (similar in principle to cordon charges).



QUESTIONS TO ASK:	
1.4	**Are there any additional pricing strategies which should definitely be considered?** *Put another way, does the list of project alternatives include all the options that best serve vulnerable communities? Have representatives of vulnerable communities provided input on measures, strategies, and goals?*
1.5	**Do the scope and budget of the planning study allow for a number of iterations so as to maximize the effectiveness of identified equity actions?**
1.6	**Have we identified community priorities from existing studies that may be relevant?**

Where: The Geographic Reach of the Study

Road pricing can affect people who might live or work at some distance from the roadway or from downtown pricing zones. It is important at an early stage to set the project boundaries so that vulnerable populations which may be impacted are included within the study area or project scope.

For example, a city considering cordon pricing or a region considering conversion of an HOV lane to HOT will need to have a sense of which drivers will be affected, where they're coming from and going to. While it's not possible for a study to include *every* commuter or traveler that uses the road—some might be passing through from distant cities, for example—it is desirable to include as many as possible. These initial geographies are also important because they help determine who should be the focus of the public engagement plan.

Decisions about the geographic reach of a study should follow a "macro-level" analysis of the potential effects on access to opportunities for vulnerable populations. It should describe the location and function of the project relative to the existing transportation network, the location of vulnerable populations, and the destinations (work, healthcare, religious, educational, retail, and public services) served by the facilities or areas being studied for pricing. The geographic reach may shift or expand once the first rounds of analytical results come in; some openness in redefining boundaries might be useful.

In practice, many studies adopt multiple geographic "levels" of analysis. For example:

- For commute impacts and predicting costs by population, a very large *travelshed* or "extended impact area" may be studied;
- A "direct impact area" is most likely to experience the potential direct impacts (such as noise, emissions, and traffic) from project construction or operation, and would typically be within a short distance of the proposed toll facility or priced zone and likely alternative routes;

- For cordon pricing proposals, the impacts on other issues need to be identified (such as, but not at all limited to, parking just inside and outside the boundary).

QUESTIONS TO ASK:	
1.7	Are all potentially impacted and vulnerable populations within the project study boundaries?
1.8	Do we know the critical services (such as shopping, medical care, education, and recreation) that are regularly used by the relevant populations? Are these included within the study boundaries? *Examples of such services include shopping, medical care, education, religious, and recreation.*
1.9	What are the growth projections for the city or region and should the planning process be using current population for the study, or projections for a future year?

ADDITIONAL RESOURCES

NCHRP's *Assessing the Environmental Justice Effects of Toll Implementation or Rate Changes: Guidebook and Toolbox* has a good introduction (pp. 9-18) to the eight kinds of road tolling or pricing actions that are typically considered, the kinds of impacts these are most likely to generate, and the initial identification of environmental justice issues. The checklists on pp. 366-372 are also useful summations of the important points to be considered in framing an impact study. It does not deal directly, though, with cordon or area pricing.

In addition, Tool #1, "Developing a Socioeconomic Profile and Community Characteristics Inventory for Environmental Justice Assessments," explains how the census can be used, including the kind of metrics available and the data tables that report those variables.

Two other equity toolkits are also worthwhile for the insights they provide. The Race & Social Justice Initiative's *Racial Equity Toolkit* was developed to help implement the vision of the Seattle Race and Social Justice Initiative.[9] Likewise, the Greenlining Institute's *Mobility Equity Framework: How to Make Transportation Work for People* is a guide to creating a more community-centered transportation planning process.[10]

EQUITY TOOLKIT

Step #2

Define Equity Outcome and Performance Indicators

Purpose

Another important part of project planning is defining the primary goals, referred to here as *outcomes*. It is important to then match these outcomes with *indicators*—the measures that we will use to gauge success or failure, and how the program can be evaluated and improved. These more detailed performance indicators help us answer the core question: does this project advance equity?

There are dozens of papers describing different types of equity in relation to congestion pricing.[11] These include overall ideas of fairness, such as by geography, not just those related to vulnerable communities. TransForm recommends a focus on two types: *Process Equity* and *Outcome Equity*.

For *Process Equity,* the key measure is the full participation of vulnerable communities in planning, implementation, and project follow-up. Process Equity is central to the long-term task of making transportation systems more equitable for all peoples, and of addressing *historical inequities* that continue to affect vulnerable communities.

As discussed in *Pricing Roads, Advancing Equity*, TransForm's Outcome Equity framework focuses on three key measures, as shown in following table.

Type of Equity:	*Key Measures:*
Process Equity	Full Participation
Outcome Equity	Affordability
	Access to Opportunity
	Community Health

Road pricing projects typically pursue goals such as congestion relief, revenue generation, and—for cordon pricing especially—impacts on greenhouse gas emissions and air quality. Social and racial equity concerns have never been at the top of the list in any of the US projects implemented so far, though Seattle's recently-initiated process does prioritize such concerns.

It is important to be clear on outcomes as well as their relative priority, since some equity strategies (such as giving toll exemptions to different groups) may seemingly work against other project goals (such as reducing climate emissions and local air pollution).

This is where it is crucial to have equity advocates at the table and to already have built strong participation. Proposed outcomes should highlight key social equity objectives. These can then be matched with *performance indicators*—the measures that will be used to gauge success or failure, and how the program can be evaluated and improved (Step 5). These outcomes and indicators should not just be in the mix, they need to be clear and *prioritized*.

It is usually necessary to do *comparative analysis* in order to determine the real impacts of proposed changes in the transportation system. At its simplest, two kinds of comparative analysis are useful. The first compares impacts from the road pricing proposal with what may be expected if road pricing is *not* adopted. The second compares the impacts on vulnerable populations with the impacts on the general population. These projections are often made for when the project is first implemented and for one or more time points in the future (such as in 10 years and/or 25 years).

The following chart depicts these comparative analyses, with arrows showing where the comparisons take place:[12]

	Vulnerable Communities:		General Population:
No Toll Plan:	Impacts	⇔	Impacts
	⇳		⇳
With Toll Plan:	Impacts	⇔	Impacts

These aggregate or "big picture" analyses can help people understand what it would take to achieve certain goals. For example, Vancouver calculated how much low-income, medium-income and high-income households might spend on different kinds of congestion pricing. People in high-income households generally drive more, so were projected to pay more as an absolute dollar figure, but low-income households would pay a larger percentage of their income. Vancouver calculated that, in order to ensure everyone paid the same proportion of their income as the high-income households would, around 20 percent of the net revenues

(between CD $170-345 million annually) would need to be returned to low income households through rebates, discounts, or other measures. This kind of analysis can be used to compare how equitable—or inequitable—different kinds of road charges are.

These comparative analyses can be useful in highlighting unfair advantages or burdens at the group or "population" level. But, ultimately, it is also important to understand the real impacts—both benefits and burdens—on *individuals* in certain communities. How much will it cost for an individual who has no option but to drive during the peak? Are reasonable alternatives like transit readily available and useful? What are the alternative routes, or times of day, that low-income travelers might use to avoid the extra costs and how burdensome would the lost time or change in schedule be? Even if the number of such individuals is not large, the tolls may be a real burden for them.

CASE STUDY
Los Angeles[13]

For its I-10 and I-110 ExpressLane pricing study, Metro identified several potential performance measures for considering effects on low-income users, including:

1. Number of low-income commuters [including percentage of Transit Access Program (TAP) users] who sign up for a transponder.
2. Number of peak-period low-income users of HOT lanes (and percentage of overall HOT lane users).
3. Usage of HOT lane credits for low-income drivers (credit redemptions).
4. Mode choice of low-income drivers (carpool versus single-occupant vehicle), compared with mode choice before the project is implemented.
5. Performance of transit service (average speed, trip time, time savings, and trip reliability) in the ExpressLanes corridors during the demonstration period.
6. General purpose lane speeds during the demonstration period.
7. Account balance problems of low-income commuters compared with non-low-income.
8. Share of time savings by low-income ExpressLanes drivers compared with the share of tolls and transponder costs they pay.
9. Trends in trip distance and trip time by low-income commuters compared with non-low-income.
10. Toll revenue investment.

Discussion

In this section we provide a short discussion of each TransForm's four equity outcomes. This is followed by a chart with some sample indicators for each outcome. Note that most of these indicators—such as changes in transit ridership or the percent of toll revenue spent to benefit vulnerable communities—can be predicted ahead of time using models and formulas; they can also serve as indicators to monitor, evaluate, and improve the program.

Full Participation

Process equity is focused on *participation* in the planning and decision-making process. In a road pricing program, process equity will continue to remain important during program implementation and evaluation.

Since low-income groups and communities of color have historically been disenfranchised from full participation, the issue is how to ensure that the views and concerns of these communities, *as community members understand and articulate them*, are fully solicited, valued, and reflected throughout the process, *especially by those making the final decisions on the project*.

A goal of full participation is to increase the level of positive impact and benefits for vulnerable communities.

Full Participation	
CATEGORY	***SAMPLE INDICATORS***
Activities	• Number of meetings and focus groups with vulnerable communities. • Dollar amount and/or percentage of project budget dedicated to equity outreach programs.
Communications	• Share of principal languages spoken in the community into which materials are translated. • Number of ethnic media outlets that receive information and publish articles about the proposal, or are targeted for advertising community meetings.
Organizations	• Staff time dedicated to technical support and funding to Community-Based Organizations (CBOs) to conduct/participate in needs assessment.
Participants	• Number of individual voices that have contributed to the community needs assessment.
Responsiveness	• Number of community-identified priorities that are being implemented as part of the program.

There are several best practices for full participation not noted in these indicators, such as having language translation at meetings, offering child care and holding some meetings in the evenings and on weekends. This toolkit's companion report has a useful chart in chapter 3 to show the degrees of participation.

QUESTIONS TO ASK:	
2.1	Where is the planning process on the "Degree of Participation" scale (found in chapter 3 of this toolkit's companion report)? *Does it need more resources or political support to increase the degree of community empowerment?*
2.2	Are the efforts planned to reach vulnerable populations likely to reach people where they are, or do they expect people to come to planning events?
2.3	Are the comments and priorities of vulnerable communities being actively catalogued? *Are there plans to address these priorities in a clear and transparent way?*
2.4	Have equity outcomes been prioritized in the list of project goals?

Affordability

At the heart of the affordability question is: Will the proposed pricing project make transportation *more expensive* for some members of vulnerable communities, in both time and money? If so, by how much? Are there ways that transportation can become *more affordable* to some or most, for example through additional public transit discounts? Chapter 3 of this toolkit's companion report includes a section on affordability, with some examples of places that are working to directly address affordability as part of their pricing program.

It is especially important to capture the financial impact of *cordon pricing* and fully tolled roadways on vulnerable communities, since there may be no realistic alternative for some low-income travelers but to use those facilities. While it is useful to understand the financial impacts of HOT lanes, most of those highways also have general purpose lanes that are free to use. In surveys of HOT facilities, satisfaction is often similar between lower- and upper-income commuters, as there is widespread appreciation of the choice to avoid congestion for solo drivers, even if lower-income commuters use them less frequently.

The table on the following page illustrates sample indicators for assessing impacts on affordability.

Affordability	
CATEGORY	***SAMPLE INDICATORS***
Discounts	• Discount level on tolls for low-income and other populations. • Discounts on transit fares or other alternatives (subsidized by tolls).
Regressiveness	• Degree to which tolls are regressive, and how much revenue redistribution is needed to make them progressive (or neutral, as was calculated by Vancouver). • Household budget spent on transportation, by income level (total amount and percentage of income). • Change in share of household income spent on transportation and housing, by income category. • Change in generalized cost of transportation (time and money) for those switching mode/route/time of travel.
Participants	• Number of people from vulnerable communities participating in (or eligible to participate in) discounted tolls or transit fares. • Ratio of those who are eligible for equity pricing programs (both for car drivers and for non-driving strategies like discounted transit) to those that have actually signed up.
Subsidies	• Amount of toll revenue invested in transportation subsidies for vulnerable communities (and as a share of total net revenue).
Savings	• Total expected savings from toll and other subsidy programs for vulnerable communities.
Alternatives	• Cost of using transit or other modes instead of driving.

QUESTIONS TO ASK:	
2.5	**How will congestion pricing change the travel costs of low-income drivers and non-drivers?**
2.6	**How do we ensure that members of vulnerable communities have ways to overcome financial barriers to participation, including for the unbanked and for those who may have trouble putting up deposits for transponders or other required technologies?**
2.7	**Do we have enough data on travel patterns and the potential changes in travel behavior to understand the potential financial impact of the tolls?** *Would it be useful to complement that data with focus groups or surveys?*

CASE STUDY Greenlining Institute	In its 2018 *Mobility Equity Framework*,[14] the Greenlining Institute suggests, as a default, households spend no more than 20% of their budgets on transportation.

Access to Opportunity

The purpose of the transportation system is to link people to all kinds of opportunities: jobs, education, health care, and social, recreational, and commercial activities. So the question of how a proposed pricing (or infrastructure) proposal may change *access* to these places is critical. A well-designed pricing strategy should be able to increase access, especially for those that rely on public transit and for drivers that find it worth the expense to use the priced facility or zone.

There are two big areas of concern with regard to access. The first is for drivers from vulnerable communities who may decide to detour, shift modes or travel time, or even choose a different destination to avoid paying a toll or cordon charge, creating both a time cost (which essentially reduced access), and potentially increased costs for gas and vehicle use (a related issue, discussed in step #1, is how trip diversion might impact affected roads and communities).

The second concern is whether the mechanics of toll payment restrict opportunity by creating barriers to use (for example, requiring users to front sums of money, such as for transponders or prepaid tolls, or to have credit card or bank accounts to link to their toll accounts).

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Access to Opportunity	
CATEGORY	*SAMPLE INDICATORS*
Funding	• Absolute dollar amount invested in transit and mobility options that benefit vulnerable communities including: ➢ New transit routes ➢ Increased frequency ➢ Subsidies for vanpools, new mobility options, etc. • Percent of funds from tolls dedicated to supporting expanded mobility options that benefit vulnerable communities.
Service Quality	• Changes in transit speed, reliability, and quality that directly impact vulnerable communities. • Changes in travel speeds and/or reliability for cars, HOVs, and those paying tolls.
Service Levels	• Number of new transit miles, routes, or transit vehicle levels/frequencies that benefit vulnerable communities.

Transit Use	• Increase in marginalized people's transit ridership attributed to transit investments. • Increase in the number of riders that use discounted fares each year.
Ratios	• Number of marginalized people paying the toll compared to those that change routes to avoid the toll (this information will require extensive surveys). • Amount of investment in vulnerable communities vs. other communities.
Access	• Change in the number of jobs, services, etc., that vulnerable communities can access within a 30, 45, or 60 minute window, by mode.

CASE STUDY Dallas / Fort Worth[15]

The North Central Texas Council of Governments (NCTCOG), the Metropolitan Planning Organization for the Dallas–Fort Worth Metroplex, developed an Environmental Justice Index that rated "Traffic Survey Zones" (TSZs) based on population density, minority population, and low-income population, for use in its Regional Tolling Analysis.

TSZs were ultimately divided into Protected zones—those with significant environmental justice concerns—and Unprotected. Analysis then focused on the impacts to these two zones using measures of accessibility and mobility as follows:

Accessibility:

- Number of jobs accessible within 30 minutes by auto
- Number of jobs accessible within 60 minutes by transit
- Population within 30 minutes to special generators (e.g., universities, regional shopping centers, hospitals)

Mobility:

- Average level of congestion
- Average travel time

QUESTIONS TO ASK:	
2.8	**Are key community destinations being analyzed and are any missing?**
2.9	**What alternative transportation choices (roads, transit, etc.) will be available to those who cannot afford the toll? For those who are likely to drive alternative routes what is the time penalty? For those shifting to transit or other modes, what time penalties may be involved?**
2.10	**Are potential benefits being fully considered, such as the potential increase in bus speed, both when the project is implemented and at some future point?**

Community Health

Vulnerable communities have historically borne a greater share of the negative health impacts of transportation systems. Freeways were often built through vulnerable communities, imposing higher levels of asthma and other health impacts of air pollution. Unsafe streets mean vulnerable communities also have higher death and injury rates from walking and bicycling.

Pricing strategies can be a way to minimize some of these impacts, by reducing the amount of overall driving taking place, by reducing the need to expand roads and freeways, and by creating revenue streams that can support transit improvements, bicycle and pedestrian infrastructure, and/or clean vehicles (serving the needs of workers as well as families, seniors, children, and those with special needs).

Another important issue to consider is access to health care. Transportation is frequently the top barrier preventing vulnerable residents from accessing medical facilities, especially for chronic and preventive care. This issue can be assessed in several ways including by noting the location of health facilities and whether they are inside or outside of a congestion pricing zone and determining whether discounts and exemptions are feasible for trips to health care. There are also potential benefits of pricing strategies that can be evaluated such as improvements in speed and reliability for emergency vehicles and whether some revenues can be reinvested in shuttles or other modes that connect vulnerable communities to health facilities.

Community Health	
CATEGORY	*SAMPLE INDICATORS*
Infrastructure	• Miles of effective/safe bike lanes and sidewalks added or improved.
Funding	• Absolute dollar amount of funds spent on bike and pedestrian improvements in vulnerable communities. • Percent of toll revenues spent on bike and pedestrian improvements in vulnerable communities.
Safety	• Change in collisions, death, and injury rates on facilities that receive investment.
Trips	• Change in the number of bicycle and pedestrian trips.
Air Quality	• Percentage of new clean air buses, funded as part of the toll investment strategy, in vulnerable communities. • Change in particulate matter or other criteria pollutants in identified impact areas.
Health	• Anticipated health benefits, disease reduction, and improvements in life expectancy (can be predicted using ITHIM or another model).

QUESTIONS TO ASK:	
2.11	**Do the main health indicators include the ones that were prioritized by vulnerable communities?**
2.12	**Is data on health impacts detailed enough to ascertain impacts on residents within a short distance of the tolled facility and/or other impacted roadways?**
2.13	**What changes in air pollution are expected?** *Where do these occur? Who do they affect?*
2.14	**What impacts on bicycle and pedestrian safety are projected?**
2.15	**Will changes resulting from road pricing reduce traffic and bring more community cohesion?** *May it further isolate some communities or particular populations?*

ADDITIONAL RESOURCES

NCHRP's *Assessing the Environmental Justice Effects of Toll Implementation or Rate Changes: Guidebook and Toolbox* has several lists that are useful for additional perspective:

- A checklist for understanding the role of quantitative and qualitative performance indicators (pp. 358-359).
- Table 3 (pp. 135-138), "Practical approaches for reaching low-income, minority, and other traditionally underserved populations," presents an agency-level perspective on reaching members of vulnerable populations.

The Greenlining Institute's *Mobility Equity Framework* identifies 12 Equity Indicators which it recommends for equity studies (pp. 11-13).[16]

EQUITY TOOLKIT

Step #3

Determine Benefits and Burdens

Purpose

Once a set of *performance indicators* is adopted, planners will conduct studies to determine the impacts of the proposed alternatives. There is no single approach to determining such impacts; several are discussed later. The analyses that will go into determining benefits and burdens should be tailored to:

- the *scale* of impacts,
- community *interest* in those impacts, and
- the *potential* of those impacts to help or hurt vulnerable populations.

Discussion

From an equity perspective, there are two fundamental ways to think about impacts. The first is whether the indicators are *relative* or *absolute*. The second is the *level of analysis*, whether at the individual, group/population, or geographic scale.

Relative impacts compare vulnerable populations with non-vulnerable ones. For example, one project alternative might result in non-vulnerable populations paying an additional 2% of household income on transportation, but vulnerable populations 5% more. In this case, vulnerable populations would pay a larger share of their household income *relative* to non-vulnerable populations.

Absolute impacts focus on the actual change experienced by individuals and groups; they're used to help maximize the potential benefit of a project on vulnerable communities. At an individual scale, this may involve looking at a set of typical trips taken during the course of the day by different individuals and then predicting the impact on them of pricing strategies and investment alternatives.

At this individual scale it is easier to understand the costs that some low-income commuters may face. These realistic scenarios can help us better understand the impacts of different types of mitigations (such as discounts, caps, and/or exemptions). These illustrative examples and case studies are a vital complement to the indicators that aggregate population data.

Impact analyses may include technical modeling. Technical models simulate future scenarios by predicting how people will choose among different options. For example, a transit ridership model might predict that a faster bus route will attract about 15% more riders; the model would also estimate where these riders come from and the impact of fewer cars on the road.

Technical models are often complex and they typically rely on incomplete or generalized information. Models can be extremely useful, though, for depicting likely reactions to changes in the transportation system and producing numbers that decision-makers (and the broader community of stakeholders) can more easily understand and work with. Just the same, equity advocates will need to work with planners to know the limits of the models, their strengths and weaknesses, and to ensure that models properly serve the needs of vulnerable communities.

Cordon pricing and area pricing proposals carry their own set of modeling challenges; the lack of US examples makes it that much harder to *confidently* predict the response of people to such pricing programs, since consumer demand must be inferred from other examples. Still, quality modeling can help us understand what changes might occur in travel patterns and choices.

One issue with pricing studies is that decision-makers and the public often focus on *costs* divorced from potential *benefits*; models can help raise a deeper awareness of those benefits. In New York City, the Move NY plan used an integrated spreadsheet model to assess traffic improvements, revenue generation, and other benefits expected from reforming road tolls and transit fare policies. It created a way to be able to test different scenarios and measure their impacts, to understand the costs *and* benefits of saved time for transit riders and drivers, as well as to predict environmental benefits and improvements in active transportation.[17]

The following list of questions, while long, addresses the range of impacts equity advocates should be looking at. Some of these questions reflect issues already raised in this toolkit and its companion report, but are also useful to consider at this stage.

QUESTIONS TO ASK	
3.1	***Affordability.*** How will the pricing change affect the travel costs of the low-income user? Will low-income drivers be "priced out" of certain trips? Will the requirements to use newly tolled facilities be too burdensome? *Also, will low-income individuals have ready access to transponders and means of paying tolls that don't require credit card or bank accounts, or the fronting of significant amounts of cash?*
3.2	***Choices.*** What reasonable alternative transportation choices (roads, transit, etc.) will be available to those who cannot afford the toll?
3.3	***Travel Time.*** If pricing produces travel-time savings, are they experienced by all users? *Will the non-toll alternatives be equitable in terms of travel time or distance? Will low-income commuters change their travel times or modes as a result of road pricing?*

3.4	***Transit.*** **What impact will the project have on transit (e.g., changes to bus routes, travel time, frequencies)?**
3.5	***Local Roads.*** **Will the project divert a substantial amount of traffic through a vulnerable community?** *If so, what impacts on air quality, noise, and safety (bicycle and pedestrian) might be expected? Will there be shifts in demand for parking that impact these communities?*
3.6	***Social Impacts.*** **Will broad changes resulting from road pricing reduce traffic and bring more community cohesion?** *May it further isolate some communities or particular populations?*
3.7	***Access to Opportunities.*** **How will the project impact the access that people from vulnerable communities have to likely destinations?** *Likely destinations include jobs, schools, hospitals, social services, places of worship, shopping, as well as to cultural and recreational resources.*
3.8	***Businesses.*** **How will the project impact business access for both customers and deliveries?** *Are any small and local businesses at risk, and if so, are there measures that can protect them?*
3.9	***Noise.*** **Will there be noise impacts attributable to road pricing?**
3.10	***Rents.*** **Are there foreseeable changes in housing or commercial rents and/or land values attributable to changes in access to opportunities?**
3.11	***Environmental.*** **What impacts will pricing have on air quality, and where are these impacts likely to be felt?** *In addition to impacts on air quality, will the toll facility improve or worsen water quality and water quantity conditions for particular populations? Will it increase the number of vehicles carrying hazardous materials through or near vulnerable communities?*
3.12	***Locations.*** **What physical infrastructure (such as tolling barriers) will need to be built, and how much of it will be located in vulnerable communities?** *Will eminent domain be required? Whose homes are likely to bear the burden?*

ADDITIONAL RESOURCES

NCHRP's *Assessing the Environmental Justice Effects of Toll Implementation or Rate Changes: Guidebook and Toolbox* has several useful resources for this step. Tool 7, "Using Travel Demand Models for Environmental Justice Assessments," as well as Tool 8, "Applying a Select Link Analysis to Assess Trip Patterns," provide excellent background on the potential uses and the limitations of these two modeling techniques.

EQUITY TOOLKIT

Step #4

Choose Strategies to Advance Transportation Equity

Purpose

The purpose of this step is to identify which set of policies and investments can best maximize equity across all groups, redress historic inequities, and minimize the harm to vulnerable populations.

Discussion

Chapter 3 of this toolkit's companion report identifies a range of strategies that can advance equity. Some of the most relevant strategies—whether for affordability, access or health—may have been identified previously and even implemented (in part) in local or regional plans or in recommendations made by community groups.

A growing number of public agencies may have already adopted a stated equity strategy; if they do, that is a great place to start. Examples include San Francisco Muni's equity strategy and the priority list for Seattle's Transportation Equity Program.[18]

While there are many different actions that can be taken to help improve the equity of the transportation system, their relative impact will vary based on a wide range of conditions and circumstances. It is for this reason that it is never enough to merely *specify* an equity program, but to develop a range of options, analyze them for their potential impacts, and make adjustments so as to minimize negative impacts (and costs) and maximize positive results. This process is necessarily iterative; the number of iterations depends on the scale of expected impacts, the resources available to deal with them, and how widespread those impacts are.

It is only after a set of iterations that the final pricing proposal and an associated equity strategy may advance to the decision-making bodies for formal approval—a process that may require equity advocates to conduct further outreach to both vulnerable communities and to decision-makers.

What kinds of strategies or actions may be implemented as part of an equity program? The table below provides a quick outline of some sample strategies; others can be found in this toolkit's companion report, while still others might be identified by the communities themselves.

STRATEGY	***EXAMPLES***	***ISSUES***
Affordability and Driver Assistance	**Driver Discounts, Caps & Exemptions,** such as: • Free or discounted transponders • Toll discounts or credits for low-income households • Exemptions for people with disabilities • No tolls during off-peak hours	If there are too many of these, then other components of the program, like increasing bus and carpool speeds or climate benefits, may be heavily impacted.
	Cash Payments (for those without credit cards or bank accounts)	Must be convenient to access and minimize up-front deposits.
	Transit Discounts • Free or discount transit passes • Subsidize bike and car share costs	
Greater Mobility Options and Safer Active Transportation Networks	**Improved Transit Service** • New routes to more destinations • Faster, more reliable service • Improved stations/stops	Must ensure routes serve vulnerable communities, operate at beginning and end of shifts; minimize need to transfer; not impose undue time penalties; and get as close as possible to job sites.
	Carpool and Vanpool Programs • Carpool matching services such as Scoop • New vanpool routes • Additional park-and-ride lots	These may often be the most effective way to serve suburban and rural areas.
	Pedestrian/Bike Improvements • Improved pedestrian network • Improved bicycle network • Pedestrian-scale lighting	Must be useful to enough people to qualify as an equity promotion measure.
	New Mobility Programs, such as: • Bike share • Car share • Creative use of Lyft/Uber or other services to connect to transit • Shuttles/Microtransit • Carpool apps and programs	Even when affordable, access might be limited. Options should exist for people without smartphones.
	Accessible Information (senior help lines, materials)	Must be easy for seniors to access and plan trips.

Programs for Seniors and People with Disabilities	**Targeted Transit/Shuttle Routes**	Must serve destinations accessed frequently by seniors at the right times.
Healthier Communities	**Encourage Clean Air Vehicles** • Credits for drivers • Purchase clean transit vehicles	Transit should be prioritized on routes that pass through marginalized communities.

QUESTIONS TO ASK:

4.1	What strategies are most promising to provide greater affordability, and potentially price certainty, as part of the pricing proposal?
4.2	What strategies will most help *commuters* from vulnerable communities?
4.3	What strategies will most benefit *non-commuters* in vulnerable communities?
4.4	What strategies have affected communities *already identified* as part of other planning processes that can be implemented/supported through funding from the road pricing project? *Such plans may be in-depth and already have built broad community support, so their value can be considerable.*
4.5	Can the planners run the transportation models on the final alternatives to get a finer grain prediction of impacts?

ADDITIONAL RESOURCES

For more information on cutting-edge equity strategies:

- San Francisco MUNI: www.sfmta.com/projects/muni-service-equity-strategy
- Seattle: www.seattle.gov/transportation/projects-and-programs/programs/transportation-equity-program

EQUITY TOOLKIT

Step #5

Provide Accountable Feedback and Evaluation

Purpose

Road pricing strategies, once implemented, will lead to shifts in travel behavior. Toll revenues will also begin to flow to programs and efforts aimed at delivering equitable outcomes. Ongoing monitoring and evaluation can help identify problems or issues that may emerge, as well as point to new opportunities to help advance equity.

Equity advocates need to ensure that:

- Monitoring and evaluation occur along a reasonable timeline (though it should also be understood that some impacts, like health and traffic safety, may by their nature take some time before they become clear);
- There are agreed-upon mechanisms for providing feedback to decision-makers on both the successes and shortcomings of the program, as well as to highlight and act upon emerging opportunities; and
- The results of monitoring and evaluation are communicated clearly and consistently with affected communities.

Discussion

In more traditional transportation projects, community engagement is focused on the period from project scoping through project completion. Congestion pricing, however, should be considered more of a dynamic tool. Downtown congestion pricing projects especially will have to be evaluated and modified at regular intervals. It is therefore important to plan for formal, continuous community engagement and collaboration *throughout* implementation, evaluation, and ongoing project monitoring and modifications.

The *Public Involvement Plan* should lay out the process for involving stakeholders and community members in all stages of the project.

It is also important to note that the final set of outcomes and indicators should still be relevant during this evaluation phase. The indicators, to the extent feasible, should be used for ongoing

project evaluation and monitoring, much as London has done.[19] In this way the original goals can continue to exercise influence over the project.

Several of the downtown congestion pricing programs have started as pilot programs, in part because of public resistance and the uncertainty of their impacts. Pilots allow for evaluation and modifications to address concerns before the permanent adoption of the program. While pilots can be useful, they can also be complicated and expensive to administer. Any pilot program needs to have clearly described milestones and decision points, with clear opportunities for impacted communities to influence the project's ultimate status.

A road pricing proposal not only presents an opportunity to advance equity at a project level; it can usher in and even institutionalize a stronger equity focus in transportation planning. Equity advocates should look for opportunities to ensure that transportation planning agencies, and the elected bodies that oversee them, make equity representation and goals a permanent and prioritized part of the process.

CASE STUDY
Stockholm[20]

Stockholm, a city of 1.2 million, implemented a 7-month pilot cordon pricing charge for the central city in 2006. Though initially unpopular, public sentiment shifted once the benefits of the program were experienced and people saw that the negative impacts were not as large as they feared. A referendum approved making the program permanent.

After the trial period, Stockholm commissioned a study analyzing the equity impacts of the cordon pricing scheme. Among the key findings, the city learned:

- High income individuals were affected more than low income;
- Men paid 65% more congestion prices than women;
- Relatively few drivers paid the majority of congestion taxes – but most paid occasionally;
- Young and low-income individuals gained by lower transit fares; and
- Journeys in central areas were shorter with a lower percentage by car.
- Program improvements have also included 18 new regional bus lines and 2,800 new regional park-and-ride spaces.

While planners had an explicit goal of reducing car traffic around the cordon by 10 – 15%, traffic has actually decreased by 22%, while greenhouse gas emissions have fallen by 14%. Businesses in the central city saw sales grow by 5%; while the rise cannot be definitively tied to the pricing program, it certainly demonstrates that there were minimal to no negative impacts on businesses. Deliveries also became easier due to improved congestion.

CASE STUDY
Portland, Oregon

After adopting a "Strategic Plan to Advance Racial Equity, Diversity and Inclusion" in 2016, Oregon Metro created a 15-member advisory and oversight community body that reports directly to the Metro Council. The body advises the Council and staff on

racial equity work, provides community oversight and accountability, and serves as a conduit of information to and from the community. In this way, impacted communities have a voice in future decision making, and build the expertise, personal relationships, and power to engage over the long-term, rather than on a case-by-case basis.

CASE STUDY

New York City

Move NYC—the congestion pricing proposal spearheaded by Sam Schwartz—includes provisions for a way to "lockbox revenue" to ensure the money raised by tolling would be used on relevant transportation projects in Manhattan by creating a new financial authority to which bridge tolls would flow; the estimated $720 million in new revenues would be directed to the MTA and its agencies. Additional legal safeguards, including commitments to bondholders, would further cement local control of the new tolls.

The revenue design addressed one of the largest equity concerns raised by opponents of road pricing strategies: distrust of government officials to spend revenues on critical, applicable transportation projects within the region. By creating a mechanism for incubating revenues, Move NY came up with a novel solution for protecting revenues. The pricing scheme would also ensure that drivers who lacked effective transit alternatives would not be unduly penalized.

QUESTIONS TO ASK:

5.1 **What *priority* is given to project funding commitments, which *entity* is making those commitments, and who specifically is accountable for follow-through?**

Are commitments, implementation, and adjustment reported publicly and transparently?

5.2 **Who is responsible for determining if the project meets its goals and commitments to vulnerable populations, and by which timeline?**

5.3 **If the project includes a pilot program,**

- **What is the proposed timeline?**
- **What milestones or targets are included?**
- **What data needs to be generated and disseminated to the public?**
- **Who is responsible for making the decision whether to make the program permanent, make further changes, or terminate the program?**

5.4 **Who is responsible for providing continuous oversight of equity issues following project implementation?**

5.5 **What equity issues remain to be dealt with? How heavily will decision makers weigh the adopted equity outcomes and indicators, relative to other priorities?**

5.6 **Are there ongoing opportunities for vulnerable communities to participate in the entire transportation planning process?**

Notes

[1] Communication with Dan Firth, X DATE, the Executive Director of Vancouver's Independent Mobility Pricing Commission. Dan recounted how even a relatively simple system like the downtown cordon in Gothenburg, Sweden, required eight such iterations. Dan had previously worked with London's and Stockholm's programs.

[2] It should be noted that the NCHRP document is mostly oriented to highway pricing strategies; while some of its insights and frameworks may be useful for cordon or area pricing proposals, there are issues and concerns with these that are not fully covered.

[3] National Cooperative Highway Research Program (NCHRP), *Assessing the Environmental Justice Effects of Toll Implementation or Rate Changes: Guidebook and Toolbox* (Washington, DC: National Academies Press, 2018).

[4] NCHRP, pp. 281-286.

[5] Richard D. Plotnick, et al., "A Geography-Specific Approach to Estimate the Distributional Impact of Highway Tools: An Application to the Puget Sound Region of Washington State," *Journal of Urban Affairs* (7 August 2011), 33(3), pp. 345–366.

[6] NCHRP, p. 95.

[7] NCHRP, pp. 303-314.

[8] Mobility Pricing Independent Commission, Metro Vancouver Mobility Pricing Study (Vancouver, BC, May 2018), www.translink.ca/~/media/Documents/plans_and_projects/regional_transportation_strategy/Research/Metro_Vancouver_Road_Pricing_Research_Study_Report.ashx.

[9] Seattle Race and Social Justice Initiative, "Racial Equity Toolkit to Assess Policies, Initiatives, Programs, and Budget Issues" (Seattle Office for Civil Rights, August 2012), www.seattle.gov/civilrights/programs/race-and-social-justice-initiative/racial-equity-toolkit.

[10] Hana Creger, Joel Espino, and Alvaro S. Sanchez, *Mobility Equity Framework: How to Make Transportation Work for People* (Oakland, California: Greenlining Institute, 2018), greenlining.org/publications/2018/mobility-equity-framework/.

[11] A particularly useful paper is Brian Taylor, "How Fair is Road Pricing? Evaluating Equity in Transportation Pricing and Finance," (National Transportation Policy Center, 29 September 2010).

[12] Adopted from NCHRP, p. 56.

[13] NCHRP, p. 310.

[14] Hana Creger, et. al. (2018).

[15] NCHRP, pp. 281-286.

[16] Hana Creger, et. al. (2018).

[17] Charles Komanoff, "The Fix: NYC Congestion Pricing Plan Looks Solid – If Cuomo Aims High," in *Streetsblog NYC* (23 January 2018), nyc.streetsblog.org/2018/01/23/the-fix-nyc-congestion-pricing-plan-looks-solid-if-cuomo-aims-high/.

[18] SFMTA, "Muni Service Equity Strategy," www.sfmta.com/projects/muni-service-equity-strategy. Accessed on 12 December 2018. And Seattle Race and Social Justice Initiative (2012).

[19] Transport for London, *Changes to the London Congestion Charge Scheme: Integrated Impact Assessment* (July 2018). On page 17 there is a summary chart comparing a proposed change to the original project goals. There is much more detail that follows, including an "equalities analysis" that begins on page 67.

[20] Jonas Eliasson, "The Stockholm congestion charges: an overview," CTS Working Paper (Stockholm: Center for Transport Studies, 2014), www.transportportal.se/swopec/cts2014-7.pdf; Transek, *Equity Effects of the Stockholm Trial* (Stockholm, 2006), www.stockholmsforsoket.se/upload/Sammanfattningar/English/Equity Effects of the Stockholm Trial.pdf; and San Francisco County Transportation Authority, *San Francisco Mobility, Access, and Pricing Study,* Final Report to the Authority Board (San Francisco: SFCMTA, December 2010), p. 6.

From: Simpson, Kristen
Sent: Wednesday, January 23, 2019 4:18 PM
To: Ranganathan, Shefali; Adkins, Genesee
Cc: Finn Coven, Jessica; Gilliss, Edie; Rolf, Kylie; Helmbrecht, Elliot; Thompson, Adrienne; Blair, Kyla; Krawczyk, Tracy
Subject: RE: Congestion pricing draft report and other to dos
Attachments: DRAFT CP Communications Best Practices White Paper.pdf; DRAFT CP Equity White Paper.pdf; DRAFT CP Impacts and Benefits White Paper_20190121.pdf; DRAFT CP Opportunity Statements_20190117.pdf; DRAFT CP Screening Memo.pdf; DRAFT CP Study Executive Summary_20190123.pdf; DRAFT CP Technologies Privacy and Legalities White Paper.pdf

Hi All,
The Phase 1 work is currently a series of white papers, which we could combine into a single report, or mix and match in various combinations, plus an executive summary and a set of opportunity statements that could be used as part of the initial outreach. You will find attached:

1. Draft executive summary
2. Draft opportunity statements
3. Draft technologies, privacy and legal framework white paper
4. Draft screening memo
5. Draft communications best practices white paper
6. Draft equity white paper
7. Draft impacts and benefits white paper

The executive summary has a section that corresponds to each of the white papers, so I'd suggest starting there, then if you want to dig deeper on something in the summary, it should be clear which white paper to reference.

Looking forward to discussing this with you tomorrow,
Kristen

From: Ranganathan, Shefali <Shefali.Ranganathan@seattle.gov>
Sent: Wednesday, January 23, 2019 1:53 PM
To: Adkins, Genesee <Genesee.Adkins@seattle.gov>; Simpson, Kristen <Kristen.Simpson@seattle.gov>
Cc: Finn Coven, Jessica <Jessica.FinnCoven@seattle.gov>; Gilliss, Edie <Edie.Gilliss@seattle.gov>; Rolf, Kylie <Kylie.Rolf@seattle.gov>; Helmbrecht, Elliot <Elliot.Helmbrecht@seattle.gov>; Thompson, Adrienne <Adrienne.Thompson@seattle.gov>; Blair, Kyla <Kyla.Blair@seattle.gov>
Subject: Congestion pricing draft report and other to dos

Hi,

At our previous meeting, we had a few to-do items that I wanted to follow up on:

1. SDOT was going to share the draft report on Phase 1 with the group to review ahead of our next meeting
2. Jessica was going send a draft list of stakeholders to seed a conversation around engagement and phase 2 next steps.

I believe that I saw a draft list from Jessica but I may have missed the SDOT report? Kristen can you send the report around in advance of our meeting tomorrow?

Thanks
Shefali

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NELSON
NYGAARD

DRAFT CONGESTION PRICING MESSAGING AND COMMUNICATIONS BEST PRACTICES WHITE PAPER (12/06/18)

Introduction

In April 2018, Seattle Mayor Jenny Durkan announced short- and long-term actions to address climate change, including analysis of a possible strategy to reduce both greenhouse gas (GHG) emissions and auto congestion through road pricing. This strategy—often referred to as congestion pricing—could also generate revenue to support investment in increased transit service, electrification (e.g., electric vehicle charging stations, electric transit vehicles) in historically underserved communities, as well as other transportation-related needs.

In addition to evaluating the high-level feasibility and impacts and benefits of various pricing tools, the Seattle Department of Transportation (SDOT) is exploring effective messaging and communications strategies to help the public and other key stakeholders understand what congestion pricing is (and is not), how the city is approaching policy research and development, and how the public can be engaged in this process. In this context, communications and messaging strategies should:

- Engage the public in developing a congestion pricing approach that is fair and equitable;
- Articulate the problem(s) that congestion pricing may help solve; and
- Communicate the benefits of congestion pricing, including how revenue might be used.

This paper provides context for the City of Seattle as it begins exploring congestion pricing options, including lessons learned from other cities around the world and best practices in public engagement. It includes the following sections:

- Summary of congestion pricing in other cities
- Overview of best practices in public engagement, messaging, and communications
- Possible approach to messaging and communications for congestion pricing in Seattle
- Recommendations and next steps

Because communications and messaging is deeply connected to social, cultural, economic and political contexts, best practices and lessons learned from other cities should be considered illustrative but not definitive.

Summary of Congestion Pricing in Other Cities

Congestion pricing has been studied, proposed, or implemented in cities across the globe. Select cities referenced in this paper are included in the table below.

Figure 1 Congestion Pricing Peers

City	Name	Description and Notes
Singapore	Electronic Road Pricing (implemented)	• Cordon pricing implemented in 1998 • Congestion pricing has been a major component of traffic management and emissions reduction plans since 1975
London	Central London Congestion Charge (implemented)	• Area pricing implemented in 2003 • Prior to adoption, funding for public transport was unreliable and congestion levels in central London were extremely high
Stockholm	Congestion Tax (implemented); called "Environmental Charges" during pilot period only	• Cordon pricing approach; policy had been considered for 30 years prior to pilot • Six-month pilot began in 2006 and was made permanent in 2007 following a referendum
Vancouver	Mobility Pricing (proposed); also referred to as "Decongestion Pricing"	• Two concepts are under consideration: 1. Regional congestion point charge with charge points at or near some—or all—regionally important crossings, complemented by further point charges at locations within the Burrard Peninsula 2. Varying distance-based charges throughout Metro Vancouver • Independent Commission gathered and incorporated feedback independently of government decision-making agencies to inform recommendations • Preliminary recommendations provided by the Mobility Pricing Independent Commission in May 2018
New York City	Congestion Pricing (proposed)	• New York was the first U.S. city to propose charging all motorists for driving in its congested core • Mayor Bloomberg's plan proposes a phased approach: - Phase One: Investing in transit connections between the central business district (CBD) and outer boroughs and suburbs; - Phase Two: Placing a surcharge on taxi and for-hire vehicle trips in the CBD; and - Phase Three: Implementing a zone pricing program for trucks followed by all vehicles entering Manhattan's CBD below 60th Street.

Overview of Best Practices in Public Engagement, Messaging, and Communications

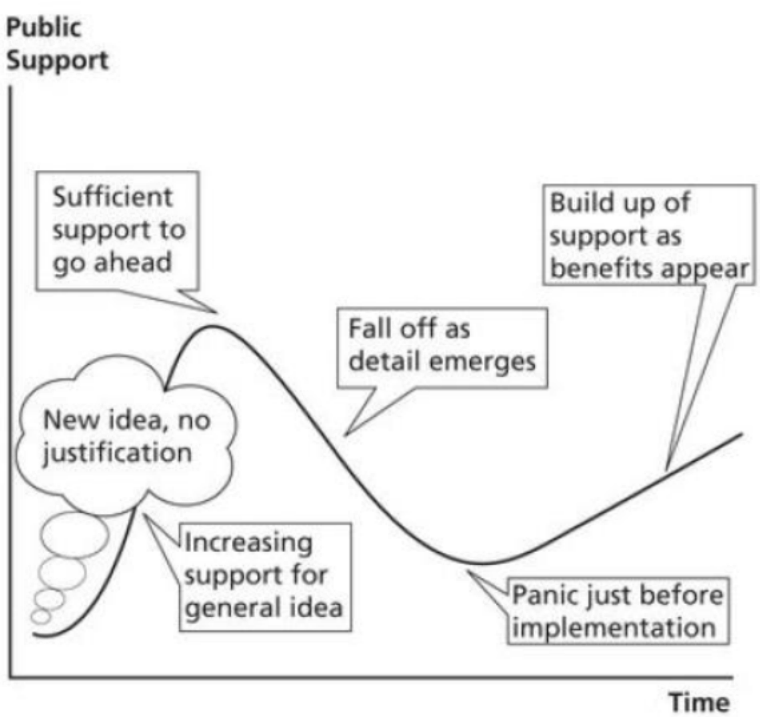
Public Perception of Congestion Pricing

Stockholm, London, and Singapore have all successfully implemented congestion pricing programs. While each city has unique engagement challenges, Stockholm's implementation demonstrated that once the idea of congestion pricing was introduced, explained, and tested (through a limited trial period), a fairly large segment of the population supported it.

Once a detailed proposal is established—but before full implementation—public support generally decreases. There may be several reasons for this. For example, the disadvantages of pricing may suddenly become more evident than the potential advantages, or fears may develop that the technical system will be overly expensive or fail to work. Figure 2 illustrates the curve of public support for road pricing, inspired by a similar experience of public perception during London's congestion pricing implementation.

This phenomenon is sometimes summarized as "acceptability decreases with detail." Once the pricing system is in place, however, support generally increases. There are two possible explanations for this: (1) the system works and people are happy with the benefits, or (2) their initial fears are not realized. This is often described as "familiarity breeds acceptability."[1]

Figure 2 Gestation Process for Road Pricing (reproduced from Goodwin, 2006)



[1] Centre for Transport Studies: Stockholm. 2014. The Stockholm congestion charges: an overview. <http://www.transportportal.se/swopec/cts2014-7.pdf>

Levels of Engagement

In any public process, there is a spectrum of opportunities to engage core audiences and use their input to shape the overall outcome of a proposed policy. Figure 3 illustrates these levels of engagement as described by the International Association of Public Participation (IAP2).

At the outset of any policy that has a public impact or benefit, policy developers should outline the key opportunities for engagement throughout the process and articulate how those opportunities can influence the process.

Figure 3 IAP2 Spectrum of Participation (International Association for Public Participation, 2004)

INCREASING IMPACT ON THE DECISION

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision. We will seek your feedback on drafts and proposals.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will work together with you to formulate solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

Messaging and Communications Themes

Based on best practices in public involvement and communications and an understanding of the ebb and flow of public perception, the following messaging and communications themes should be applied in developing a congestion pricing policy.

Goal- and Solution-Driven Messaging

In developing messages that are both goal and solution-driven, agencies should:

- Identify a focused set of goals that a congestion pricing program will achieve (i.e., what is the problem pricing will solve) and use these goals as the messaging focus throughout exploration, policy-making, and implementation; and
- Ensure that key messages are developed with transparency to foster trust and encourage public engagement.

Congestion pricing programs are most often motivated by the goal to reduce traffic congestion in a central business district. In some cities, this message is framed around improving air quality and reducing GHG emissions. Often, pricing programs are messaged as a response to the problem

of congested roadways and increased travel times. Singapore, London, and Stockholm all successfully implemented congestion pricing with the explicit goal of traffic management.

Stockholm and London both established clear messaging around goals and objectives early in their processes. Though public support varied throughout the policy-making phase, high-level messaging and communications around specific goals was consistent, and in Stockholm, public support ultimately skyrocketed after implementation of a pilot program.

Vancouver used the messages and graphic shown in Figure 4 to clearly and concisely articulate its goals. Note that these messages were focused on how mobility pricing (Vancouver's nomenclature) is solution-oriented.

Figure 4 Vancouver Mobility Pricing Goals

Understanding Audiences and Stakeholders

As a core principle of developing any communications or messaging plan, understanding audiences and stakeholders is critically important in the early phases. Shortly after developing strong goals and messages agencies should:

- Engage a variety of audiences early and regularly, especially potential supporters and skeptics and populations that may be adversely affected (or have a perception of adverse effect) by a proposed policy;
- Develop partnerships with organizations from a variety of stakeholder groups;
- Conduct outreach to different geographies, especially outside the urban core; and
- Develop and grow awareness of the program with trusted spokespeople and thought leaders from a variety of organizations and perspectives.

Equity is an important component of exploring congestion pricing proposals and how potential polices are communicated and approached. Vancouver incorporated equity metrics in their mobility pricing proposal, noting that discussions of equity demanded they start with clear objectives and specific strategies for how pricing-generated revenue would be used.[2]

[2] City of Vancouver. August 2018. Workshop presentation.

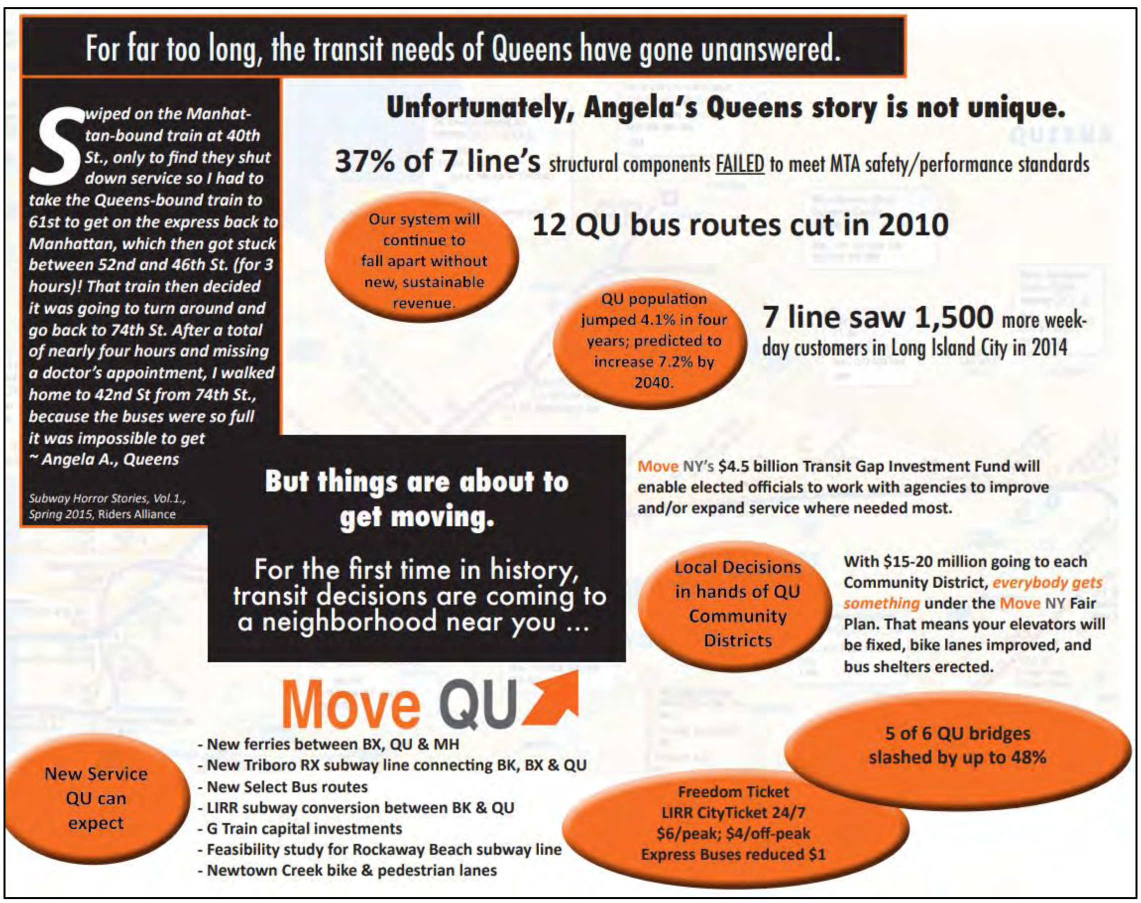
Ensuring engagement with all audiences—especially potentially disproportionately affected audiences—means that any public engagement approach must lead with equity. (See the Draft Pricing and Equity White Paper for specific recommendations about equitable engagement.)

Messaging to different market segments should seek and incorporate feedback—especially issues and concerns—from many stakeholder groups. One possible process for engaging different market segments in congestion pricing messaging suggests that the lead agency should:

- Anticipate the issues and concerns of different groups
- Meet with stakeholder groups proactively to gather and incorporate direct feedback; actively seek out and engage skeptics and critics
- Address issues and concerns in developing a potential congestion pricing policy
- Communicate how feedback from stakeholders is incorporated

Tailored messages should focus on demonstrating an understanding of each group's concerns, what options they have, and how they will experience potential benefits. Figure 5 shows pro-pricing advocacy group MoveNY's factsheet, which lists benefits that the outer borough of Queens could expect from a congestion pricing program.

Figure 5 MoveNY Queens Benefits Factsheet



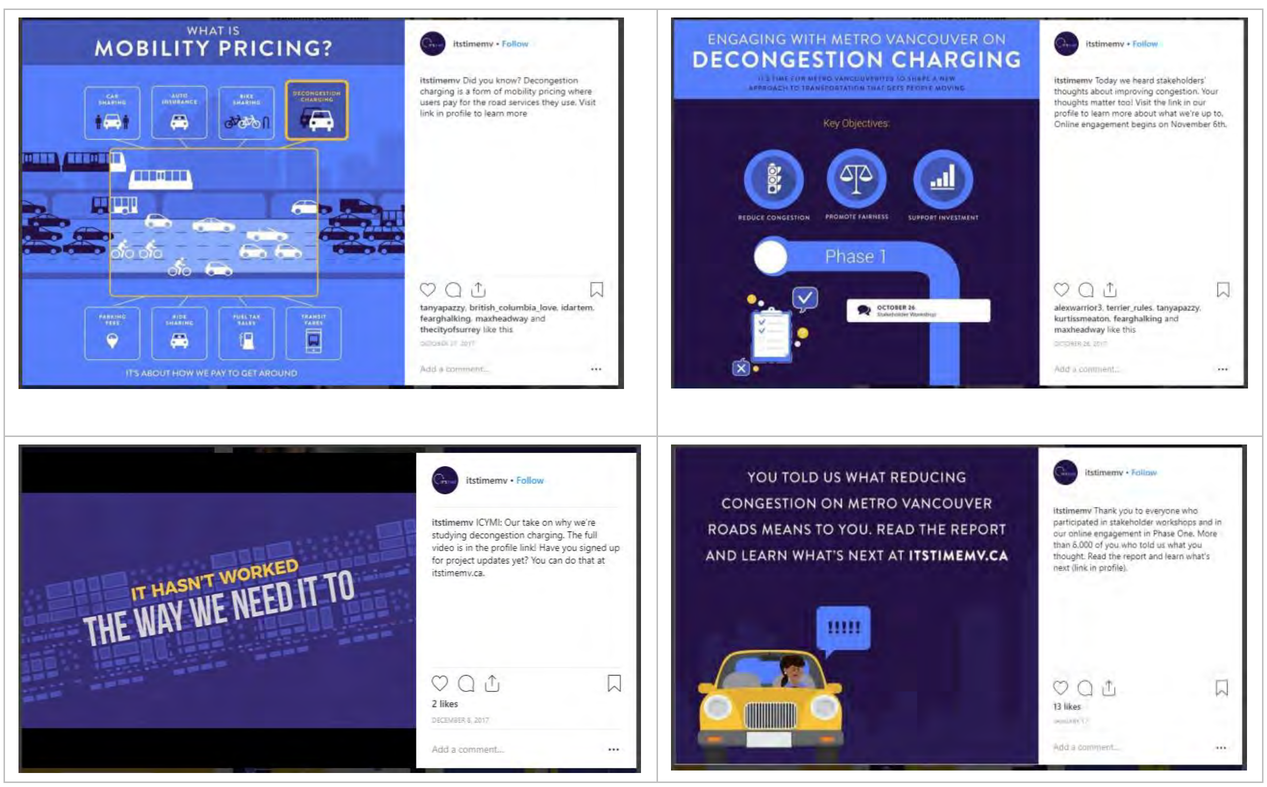
Clear Communications and Materials

Following development of clear goals, strong and consistent messaging, and an understanding of audiences and stakeholders, the next step in effective communications is to develop collateral that supports the goals and messaging, is tailored to specific audiences, and reflects the stage of policy development. This information should respond to the needs of key audiences and be developed in easy-to-understand language and formats that clearly articulate core messages. Principles for effective communications materials include:

- Ensure communications and materials use consistent, top-line messages throughout the life of the project
- Use traditional media sources (e.g., television, radio, newspapers) to reach the broader public to tell the story and illustrate the purpose and need of a potential policy
- Leverage social media, including through project partners, to seek input and feedback and to grow awareness among broad segments of the population

Tools and media to reach people are constantly and rapidly changing; therefore, the tools and strategies to deliver core messages will continue to evolve. In Vancouver's recent mobility pricing engagement process, they used social media and online platforms to gather feedback, as well as traditional public engagement methods including in-person open houses and workshops. Below are some examples of the types of visual messages and graphics included in Vancouver's "It's Time" campaign (implemented by Vancouver's Independent Mobility Pricing Commission) posted to the social media site Instagram.

Figure 6 **"It's Time"** Metro Vancouver Instagram Posts



Approach to Messaging and Communications

Messaging and communications should evolve throughout the development of a congestion pricing policy. Figure 7 shows the policy development process, from the problem definition and exploration stage through the implementation stage. Figure 8 illustrates the parallel processes specific to messaging and communications. As mentioned above, the problem statement or goals for congestion pricing should remain consistent throughout the development of the policy, while messages, communications, and engagement strategies should evolve and build upon previous stages. The following sections outline effective communication and stakeholder engagement steps for each stage of policy development.

Figure 7 Stages in Policy Development

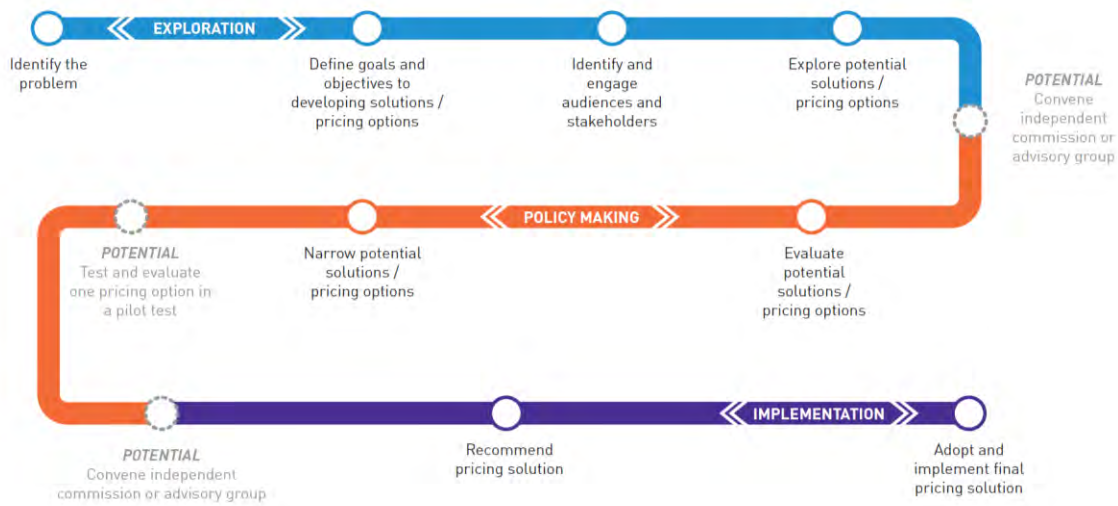
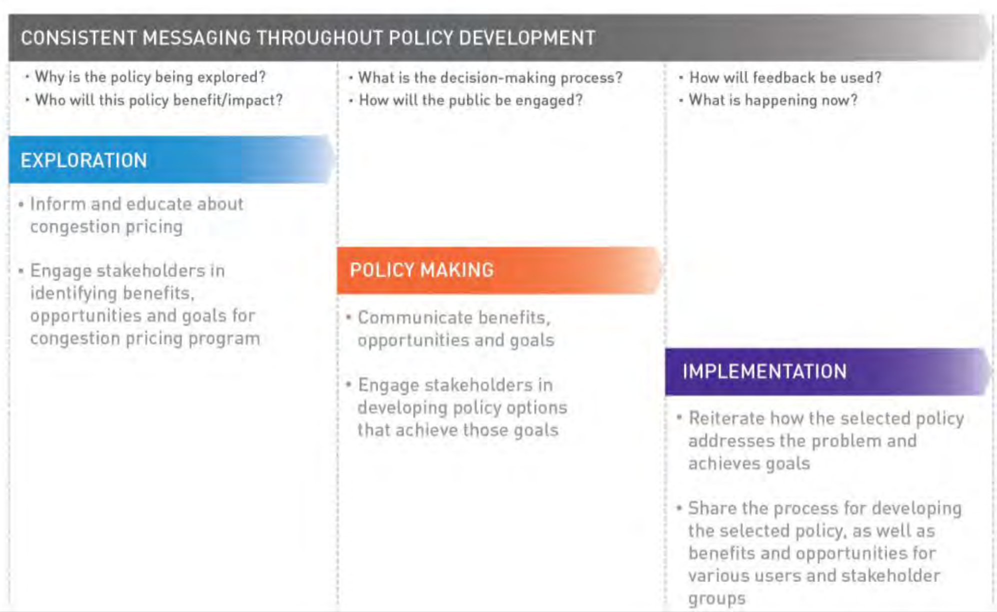


Figure 8 Communications and Messaging Milestones in Policy Development



Stage 1: Exploration

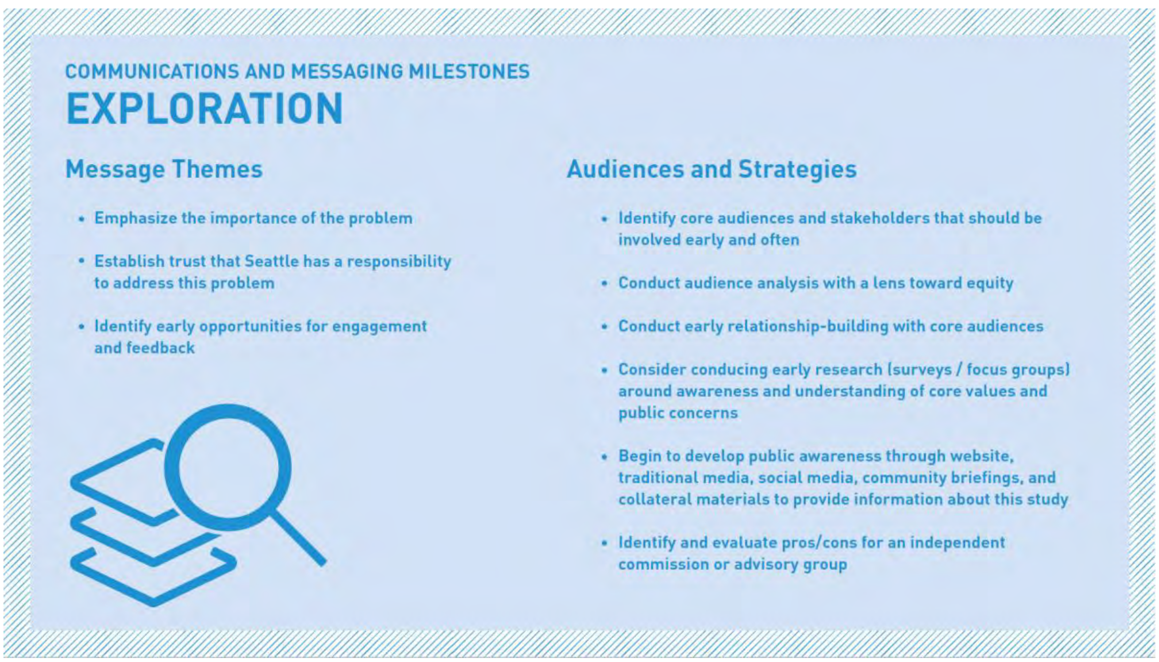
The exploration stage of policy development includes the following steps:

- Identify the problem
- Define the goals and objectives in order to find potential solutions to the problem
- Establish criteria—tied to the program goals and objectives—to evaluate the solutions
- Present an initial set of policy options for consideration

During this stage, core audiences and stakeholder groups should be identified and engaged in defining the goals and objectives. Because the goals and objectives will inform the criteria by which to evaluate potential pricing options, a range of stakeholders should be engaged and broad public feedback should be sought and incorporated. People should understand how they are being engaged and their opportunities for informing the policy options in order to build trust and allow for productive stakeholder and public engagement at later stages of the process. Appendix A lists possible market segmentation groups for engagement in Seattle's congestion pricing study.

Figure 9 summarizes the key messaging themes and communications strategies appropriate for the exploration stage.

Figure 9 Communications and Messaging Milestones: Exploration



LESSONS LEARNED: EXPLORATION STAGE ENGAGEMENT

New York's Stakeholder Skepticism and Limited Early Engagement to Outer Boroughs

New York City's initial pricing proposal was viewed as a tax, with no clear communication of specific benefits for different stakeholder groups.[3] Skeptics and stakeholders in outer, more auto-oriented boroughs were not engaged early in the process—many in these areas believed they would bear a disproportionate financial burden, relative to Manhattanites south of 86th Street. There was also little trust that revenue generated would be used to fund transportation improvements.

Sam Schwartz has stressed that engagement of the outer boroughs and known skeptics was especially important in the development of the MoveNY pricing program. The outer boroughs were strongly opposed to the initial proposal, but incorporating their concerns eventually led to a more equitable policy and the ability to message "what's in it for them."

Edinburgh's Mixed Messages and Weak Consensus about Congestion as a Problem

In Edinburgh, Scotland, there was only weak consensus that congestion was a big and present issue. Public messaging focused on congestion as a future problem. Edinburgh communicated a very large number of goals and objectives for implementing a congestion pricing plan, which confused the public. The city's congestion pricing plan ultimately lost public support, connecting back to the phenomenon that "acceptability decreases with detail."

Stage 2: Policy Making

During the policy-making stage, potential options developed during exploration will be more fully evaluated and public feedback will be sought and incorporated. The following steps should occur at this stage of the process:

- Explore establishing an independent commission or similar body to act as the lead for this and future stages
- Evaluate solutions developed during the exploration stage
- Seek public feedback on those solutions and the evaluation
- Develop recommendations to final decision-makers
- [redacted]

Figure 10 summarizes the key messaging themes and communications strategies appropriate for the policy-making stage.

3 Sam Schwartz. August 2018. Workshop presentation.

Figure 10 Communications and Messaging Milestones: Policy Making

LESSONS LEARNED: POLICY-MAKING STAGE

Vancouver's Independent Mobility Pricing Commission

Vancouver established a fully independent Mobility Pricing Commission to explore the pros and cons of congestion pricing (known as mobility pricing or decongestion pricing in Vancouver), to independently gather feedback and public input, and to provide recommendations to Vancouver's policy-making bodies.

Vancouver's engagement program was inclusive but rushed—it was executed without the time needed to properly educate the public and stakeholders on the purpose and principles behind congestion pricing and its associated confusing terms, particularly "mobility pricing" (how we pay for all mobility) and "decongestion charging" (paying for road use to manage congestion). Although it had many strengths, the use of an independent commission contributed to a failure to describe congestion pricing in the context of other transportation measures and improvements.

Washington Road Usage Charge Pilot Project

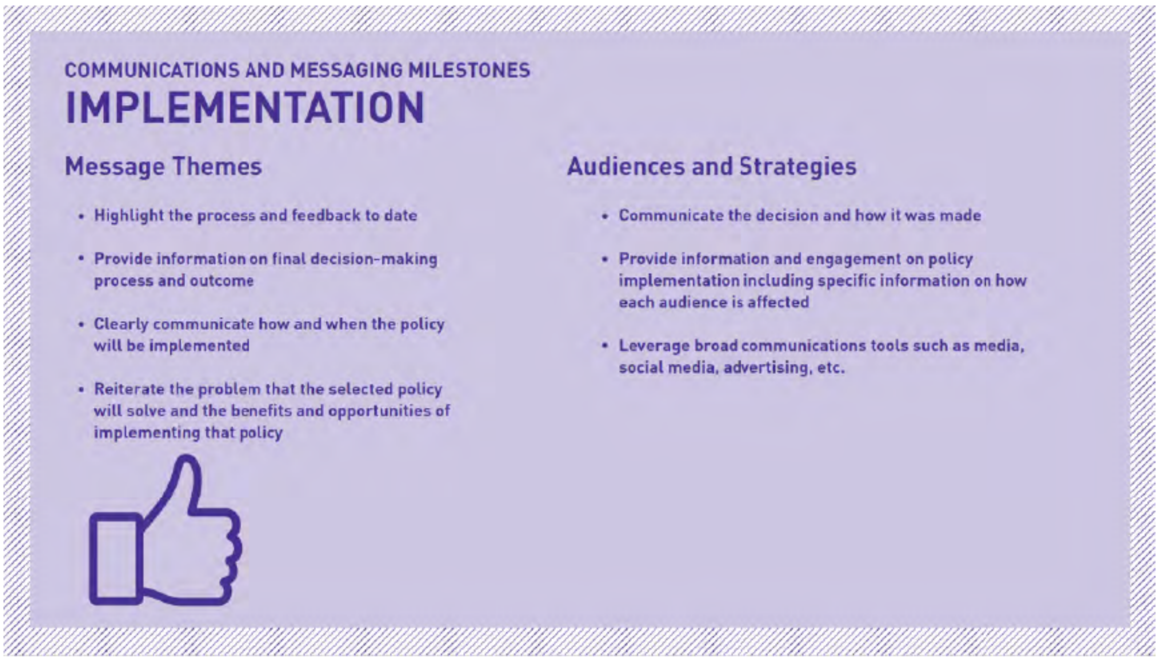
After over 10 years of policy exploration and examination, the Washington State Transportation Commission is currently conducting a pilot test of a potential statewide road usage charge to evaluate whether such a charge is a viable replacement for the state's gas tax. This pilot was launched during the policy-making stage and will inform state legislators during the implementation phase. While the pilot is still underway and final conclusions are not yet available, over 5,000 drivers across the state expressed interest in being part of the 2,000 driver participant pool, a much higher degree of interest than anticipated. This is an example of a highly participatory process that provides an opportunity for deep engagement and feedback in the development of a complex and controversial potential policy.

Stage 3: Implementation

The implementation stage [redacted]. During this stage an independent commission or advisory body (if established) could recommend or select a pricing strategy for adoption and implementation by the decision-making authority (in this case, the City of Seattle). Once a system is implemented, travelers (not limited to drivers) need a strong understanding of how the system works, how much they are charged, and how to access other transportation options.

Figure summarizes the key messaging themes and communications strategies appropriate for the implementation stage.

Figure 11 Communications and Messaging Milestones: Implementation



LESSONS LEARNED: IMPLEMENTATION STAGE

London's Congestion Charge

London's Congestion Charge Zone (CCZ) was implemented and operational in early 2003. Although at times still controversial, it remains in place 15 years later and has significantly reduced congestion in central London. In 2007, Ken Livingstone, who was the mayor of London and champion of the CCZ, provided insights on why London's congestion charge was so successful. Livingstone cities five key factors, four of which include core principles of communications, messaging, and stakeholder engagement:

"Overall, the scheme is a success and has worked better than I hoped, with far fewer teething problems than I expected. Yet congestion charging has always been a controversial policy, and others thought it too risky to undertake. In order to implement the scheme it was necessary to:

1. Build and maintain sufficient public and stakeholder support for the scheme during its development and introduction;
2. Conduct meaningful consultations with a readiness to make changes to the scheme;

3. Provide additional public transport services to enable motorists wishing to switch to alternative choice of transport;
4. Provide widespread public information and specific traffic management measures on the inner ring road and also outside the zone to minimize potential problems at the scheme launch which could have undermined its credibility; and
5. Deliver the scheme quickly so that its benefits could accrue to London as soon as possible. The inevitable disruptions associated with implementation were offset by experience of benefits after implementation during my first term, giving Londoners the opportunity to express their views on the congestion charge at the ballot box."[4]

Stockholm's Pilot Introduction Leading to Implementation

Stockholm was successful in implementing a congestion pricing system by first implementing a pilot program. Prior to the pilot, public acceptance was very low. Through that pilot, stakeholders and the public experienced congestion pricing first hand, saw its value, and began to accept the system. Although often effective, a pilot project can be an expensive and high-risk strategy—pilots can have high associated costs, and public buy-in can falter with negative experiences during a pilot and/or the perception that their feedback has not been incorporated or reflected.

Recommendations and Next Steps for Seattle

This white paper presents a snapshot of best practices and lessons learned from a select group of cities that have explored or implemented a congestion pricing policy. This paper is not a comprehensive summary of the pros and cons of such policies as it related to communications and messaging, but offers considerations for the City of Seattle.

Suggested next steps for the City of Seattle are the following:

- **Define the key purpose and goals for congesting pricing and form a messaging and communications strategy around them.** This should be done as early as possible in the process, even if the full pricing strategy and policy is not yet developed. In the absence of strong messaging, stakeholders and the public form their own understanding and narratives, which can be challenging to reform or change. The purpose and goals form the foundation of long-term and consistent messaging used through the policy development.
- **Lead development of a full public engagement and communications strategy with equity.** In following the steps outlined above, it is important to ensure that in developing goals and messages and identifying audiences core questions about equitable engagement are asked, answered, and incorporated into plans and strategies (see Pricing and Equity White Paper for details and core questions to answer).
- **Tie congestion pricing messaging to citywide transit investments and improved travel alternatives.** This is a critical communications element, as it relates to creating an equitable system. *Seattle Transit Blog* has already charged that, "Without better transit, the congestion charge begins to look less like an attempt to help everyone get around faster, and more like a device to reserve street space for the wealthiest

[4] Livingstone, Ken. 2004. ***Journal of Planning Theory and Practice.*** The challenge of driving through change: Introducing congestion charging in central London.

drivers."[5] The City should be clear that pricing is only one part of an overall strategy—and it may be the part that makes other mobility improvements, like reallocating road space to bus lanes and cycle facilities, possible.

- Ensure authentic opportunities for feedback, and demonstrate how feedback is incorporated. Development of any controversial policy should include opportunities for feedback and input, and the communications and messaging should articulate how that input will be used to shape a potential system. Public input must be reflected in the system design to demonstrate a commitment to listening and valuing feedback. The City should consider leading a regional values conversation as a way to guide the study and establish program priorities. This would also help the City of Seattle develop messaging and terminology that reflects local values and concerns. A review of international road pricing schemes and technologies by D'Artagnan Consulting and the New Zealand Ministry of Transport supports this approach, noting that "a high-stakes policy like congestion pricing requires deep understanding of local geography and responsiveness to local conditions and concerns."
- Explore the possibility of establishing an independent commission or advisory group to evaluate potential policy options. In Vancouver, an independent commission was established to further explore policy options, seek and incorporate public feedback, and provide recommendations to the Mayors Council and TransLink Board of Directors. Fully independent commissions are not often used in the Puget Sound region, but advisory groups are frequently formed to help guide policy development for complex and controversial projects. If an independent commission or advisory group is established, it will be important to consider:
  - Equity – Ensure broad representation of stakeholders and audiences potentially impacted or benefitted
  - Mission – Ensure the group has an understanding of their mission and charge, and that the public also understands the role of the group
  - Decision-making or recommendation authority – Ensure that the group and external stakeholders fully understand and respect the recommendations or decisions made by the group to maintain trust in the policy-making process
- Implement a pilot program to test the selected policy. Given the sensitivity around road pricing, successful systems have mitigated risks by piloting a potential approach and moving incrementally through systematic policy adjustments.
- Be prepared for support to decline as implementation approaches. Plan the timing of implementation carefully to coincide with transit or other transport investments, election cycles, and other major events.

[5] Lawson, David. August 14, 2018. *Seattle Transit Blog*. Hearing about congestion pricing? Ask about transit investment. <https://seattletransitblog.com/2018/08/14/hearing-congestion-pricing-ask-transit-investment>

Appendix A: Market Segmentation

See attached Excel file, which warrants additional discussion with SDOT. When final, the file will become a table in this appendix with segmentation by stakeholder type.

Appendix B: References and Resources

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Seattle Congestion Pricing Study

Pricing and Equity White Paper

January 2, 2019 Draft

Draft for Internal Review Only

TransForm

Our communities. Our transportation. Our future.

Overview

Transportation has reinforced inequality

America's transportation investments and policies have helped to create—and reinforce—racial and social inequities. Since the 1950s, the emphasis on moving cars quickly, combined with sprawling land use patterns, has come at high price. The combination of a lack of infrastructure for walking and bicycling and inadequate public transportation has limited access to opportunities.[1] A Harvard study found that such access (measured as commuting time) was the *single strongest factor* behind whether people can escape poverty.[2] For members of marginalized communities who do own vehicles, transportation can consume over 30% of their annual income.

Transportation investments have not only favored those with the resources to own, operate, maintain, and safely store (park) a motor vehicle; they have often funded roads that cut through lower-income and minority neighborhoods, those without the political power to effectively push roads elsewhere. As a result, low-income and minority communities have borne the brunt of air quality impacts with elevated rates of chronic illnesses triggered by air pollution.[3] King County households with annual incomes less than $35,000, for example, experience the highest rates of asthma—over 60% higher than those with incomes above $50,000.[4]

Transportation is also responsible for an astonishing 64% of greenhouse gas emissions in the city.[5] The same vulnerable communities that are impacted by historic inequities face disproportionate risks from climate change. For example, people with disabilities may have difficulty evacuating during emergencies, and older residents have higher risk for pre-existing health conditions.

If we are to successfully move beyond a car-centric system that marginalizes communities of color and lower incomes, we need policies that are both equitable and redress historic disenfranchisement.

Seattle is exploring new transportation solutions

Seattle faces many of the same transportation challenges as cities across the country. Worsening traffic congestion has lengthened commutes for drivers while slowing down buses and increasing the cost of operating public transit. Programs to speed buses through low-cost improvements like those on the Rapid Ride E Line can help. Business Access and Transit lanes and transit signal priority at 20 intersections have shaved around 8 minutes off a ½-hour trip. Yet trips on transit still take too long for most people. Incomplete networks for people walking and bicycling deter the most affordable and often most efficient forms of transportation.

With SR 99 set to begin tolling in 2019, potentially diverting more traffic to city surface streets, the City of Seattle is starting to explore whether congestion pricing may help achieve a variety of City goals. In its initial phase of exploration the study will look at different forms of pricing, such as charging a fee when a vehicle crosses into a zone that experiences intense congestion (known as *cordon pricing*, this approach is relatively new and has only been applied to downtowns in several international cities). Other forms of pricing may be more targeted to specific types of vehicles, for example, charging ride-hailing fleets or commercial vehicles within a specific area.

By internalizing the true costs of driving and generating revenue that funds alternative modes of transportation, congestion pricing can be one piece of a more equitable transportation system. However, without a clear process for incorporating community voices and supporting more affordable, accessible, and healthy transportation options, pricing may exacerbate inequality. As with so many issues, the design and implementation will determine the equity impacts. The devil is in the details.

Prioritizing equity as part of congestion pricing

The Seattle Department of Transportation (SDOT) prioritizes racial and social equity. The department established an Equity Program in 2017 to:

- Provide safe, environmentally sustainable, accessible, and affordable transportation options.
- Support disproportionately cost-burdened communities in Seattle to thrive in place.
- Mitigate the effects of displacement, including racial disparities related to displacement.

SDOT is committed to prioritizing affordable transportation options and defining broader transportation equity goals and strategies in partnership with community members and other stakeholders. This commitment is especially vital for major proposals like congestion pricing.

This equity white paper is designed to help frame some of the most important equity issues in this first phase of study. It is meant to help SDOT ask and answer the right questions around equity. It should also be useful for community members who are engaging in these conversations for the first time.

The white paper has the following sections:

- Overview
- Pricing: How can pricing advance racial and social justice?
- Five Key Steps in Pricing: Building equitable outcomes into pricing programs
    - 1: Identify Who, What, and Where
    - 2: Choose Equity Outcomes and Performance Indicators

  - 3: Determine Benefits and Burdens
  - 4: Devise Programs to Advance Transportation Equity
  - 5: Provide Accountable Feedback and Evaluation
- General Equity Impacts of Different Pricing Strategies

This first phase of Seattle's congestion pricing study correlates with steps 1 and 2. The second phase is expected to start by mid-2019 and will cover steps 3, 4 and 5.

Additional Resources

For those who would like to dive even more deeply into issues of pricing and equity, an excellent guidebook and toolbox for planners who are leading these planning processes was released by the National Cooperative Highway Research Program (NCHRP), *Assessing the Environmental Justice Effects of Toll Implementation or Rate Changes.* At well over 400 pages, it is likely overly technical for people who don't typically conduct detailed planning studies. Yet it has many excellent examples of where a particular tool, analysis, or strategy has been used to help advance equity. The most relevant sections are referenced at the ends of steps 1 and 2 below. We encourage equity advocates who dive deep into planning to reference this guide.

The City of Seattle's Racial Equity Toolkit has served as an important reference in developing this 5-step framework.

Pricing

How can pricing advance racial and social justice?

Congestion pricing is based on the idea that traffic congestion comes with high costs to society and to individuals in the form of air and climate pollution, traffic collisions, and slower commutes for everyone. When tolls are charged—especially when based on demand so that the more congested a road becomes, the higher the fee to use it—some people make changes to some of their trips. To avoid tolls, they may choose to drive during off-peak times, shift to carpools or transit, combine trips, or even choose a different destination.[6] Those who pay enjoy a faster trip with less congestion. Even a relatively small reduction in the number of vehicles on the road can significantly reduce delays for everyone.

Cities such as London, Stockholm, Singapore, and Milan have implemented cordon or area pricing for their downtowns while greatly expanding their public transit networks, typically reducing driving (vehicle miles traveled) by 15-20% and congestion by 30% or more. In addition

to Seattle, other North American cities including Vancouver, San Francisco, and New York are exploring congestion pricing.

There can be problems and unintended consequences with pricing. When implemented without a clear focus on social and racial equity, it can burden low-income people with new costs, just when skyrocketing housing costs are forcing many to move to the suburbs where driving is often the only option for most trips.

The chart below identifies some basic strategies that can address affordability and meet other important goals. A deep analysis of affordability for those who currently drive—as well as for people who use other modes—will be an important part of the next phase of this study.

Seattle has a chance to design a program that truly prioritizes racial and social equity, but key questions remain: Can we harness the efficiency of congestion pricing to identify and implement strategies that are *also* equitable? Is it possible for disadvantaged and vulnerable communities, who currently suffer from inadequate access to opportunities (and for those that drive, high relative costs) to *benefit* from road pricing proposals? The section starting on page 14 looks at the types of outcomes and indicators that can be used to evaluate whether the chosen strategies can combine to advance a racial and social equity agenda.

As part of future public engagement, there will be several opportunities to identify priority strategies that are on this list and specific ones that should be added. Some strategies may have been identified by the community in a recent transportation plan, but still need to be funded. Other strategies may look beyond making transportation more affordable to also consider whether there are ways to stem displacement.

Sample strategies to advance an equity agenda

STRATEGY	EXAMPLES	ISSUES
Affordability and Driver Assistance	**Driver Discounts, Caps & Exemptions,** such as: • Free or discounted transponders • Toll discounts or credits for low-income households • Exemptions for people with disabilities • No tolls during off-peak hours	If there are too many of these, then other components of the program, like increasing bus and carpool speeds or climate benefits, may be heavily impacted.
	Cash Payments (for those without credit cards or bank accounts)	Must be convenient to access and minimize up-front deposits.
	Transit Discounts • ORCA LIFT transit discounts	

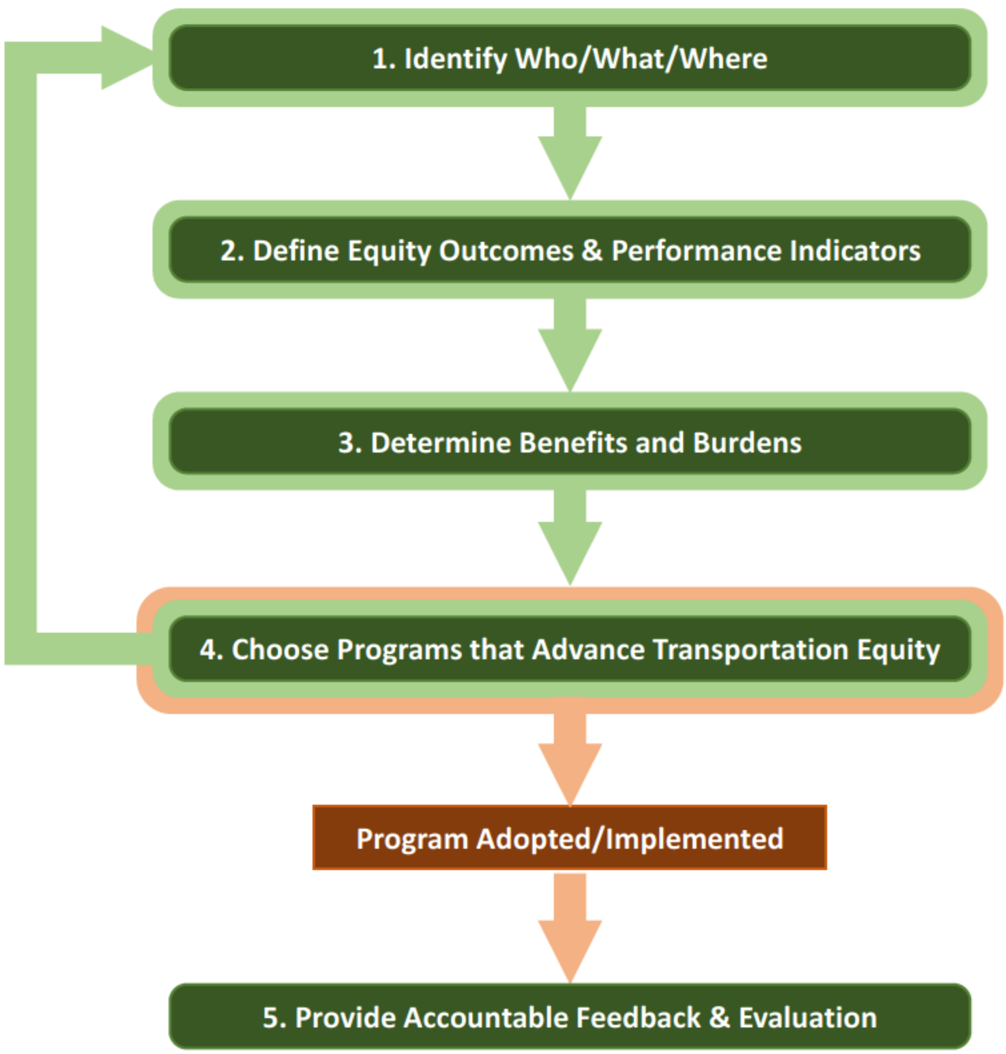
	• Subsidize bike and car share costs	
Greater Mobility Options and Safer Active Transportation Networks	**Improved Transit Service** • New routes to more destinations • Faster, more reliable service • Improved stations/stops	Must ensure routes serve vulnerable communities, operate at beginning and end of shifts; minimize need to transfer; not impose undue time penalties; and get as close as possible to job sites.
	Carpool and Vanpool Programs • Carpool matching services such as Scoop • New vanpool routes • Additional park-and-ride lots	These may often be the most effective way to serve suburban and rural areas.
	Pedestrian/Bike Improvements • Improved pedestrian network • Improved bicycle network • Pedestrian-scale lighting	Must be useful to enough people to qualify as an equity promotion measure.
	New Mobility Programs, such as: • Bike share • Car share • Creative use of Lyft/Uber or other services to connect to transit • Shuttles like Chariot • Carpool apps and programs	Even when affordable, access might be limited. Options should exist for people without smartphones.
Programs for Seniors and People with Disabilities	**Accessible Information** (senior help lines, materials)	Must be easy for seniors to access and plan trips.
	Targeted Transit/Shuttle Routes	Must serve destinations accessed frequently by seniors at the right times.
Healthier Communities	**Encourage Clean Air Vehicles** • Credits for drivers • Purchase clean transit vehicles	Transit should be prioritized on routes that pass through marginalized communities.

Five Key Steps in Pricing Equitably

Building equitable outcomes into pricing programs

Separate from this Seattle-focused document, TransForm is developing a congestion pricing and equity toolkit that can be used by any organization considering pricing. Its focus is on supporting equity advocates and decision-makers in designing and implementing a pricing program that can advance a racial and social justice agenda.

The toolkit lays out five primary steps, from program design to implementation.
This process, though, is not linear. The following graphic depicts the iterative nature of the process.



Once an initial set of actions is identified, these should be reviewed in light of the first set of steps in this Toolkit. Does the initial specification of who, what, and where need to be adjusted? Are the chosen indicators adequate to framing the impacts? What more might be needed? Are benefits and burdens properly distributed? What else needs to be addressed? What changes in program elements, or new elements, are suggested as a result of this analysis?

It is only after a set of iterations that the final pricing proposal may advance to the City Council for approval.

The following pages of this white paper are intended as a primer to support strong participation and deep engagement from vulnerable communities. Each section includes some sample questions that can be asked at that stage in program development.

To align with Seattle's process, which is in its very earliest phase, this white paper focuses on the first two steps. It should be expected that the first several steps often overlap and are iterative. When defining indicators in step 2, for example, it is important to understand what can actually be measured and how, which is a focus of step 3.

Needless to say, engagement and collaboration with a broad array of community stakeholders will be critical to producing equitable outcomes. In more traditional transportation projects, that engagement may be focused on the initial scoping to the time the final project is chosen. Congestion pricing, however, should be considered more of a dynamic tool than typical transportation infrastructure projects. Pricing projects are typically evaluated and modified at regular intervals. It is therefore important to plan for formal, continuous community engagement and collaboration *throughout* implementation, evaluation, and ongoing project monitoring and modifications.

PRICING EQUITY STEP #1

Identify Who, What, and Where

The earliest stages of a pricing equity study are where several key decisions are made, namely:

***Who*?**	The populations that need to be considered from an equity perspective.
***What*?**	The type and nature of pricing to be considered. Complementary strategies may also be discussed at a high level.
***Where*?**	The geographic reach of the study.

In planning terms, this stage is where the study's *scope* is developed. Seattle is currently in the very initial part of Step #1. This first step is the focus for the remainder of 2018 and early 2019. It will create a more detailed lens for future research, outreach, and program design.

Who: Populations to be studied

Any equity study is required to look at the impacts of major transportation projects on *minority* and *low-income* populations. Under Federal guidelines, *minority* populations include Black, Hispanic or Latino of any race, Asian American, American Indian and Alaskan Native, Native Hawaiian, and Other Pacific Islanders. It also includes individuals with limited English proficiency of any race. *Low-income* populations are any whose household incomes are at or below Federal poverty guidelines.

From an equity perspective, it is important to consider other vulnerable populations. Seattle's Transportation Equity program also focuses on people with disabilities, people experiencing homelessness, LGTBQ people, youth, and seniors.

Who else may be considered? Should the study look at barriers and issues specific to immigrants and refugees, local small businesses, and even services like non-profit meal delivery services? These are important questions during this initial scoping phase. Once a more comprehensive study is underway the community may identify additional focus populations.

QUESTIONS TO ASK:	
1.1	Are all populations adequately addressed in the study? *Should priority be given to certain populations? Why?*
1.2	Does the way groups are designated capture all relevant people? *For example, several studies from Seattle, King County, and Puget Sound Regional Council identify*

	vulnerable communities. Which of these should be a focus? How can we make sure to account for vulnerable residents who aren't in these areas of concern?
1.3	**Are the criteria used to identify groups fair and accurate?** *For example, does the measure of household income adequately capture the target population? In some metro areas, for example, households earning up to twice the Federal poverty level may still be economically disadvantaged and in need of more equitable policies.*

What: The proposal and viable alternatives

Seattle is starting with a wide view of potential congestion pricing strategies to study. The initial list of tools that may be considered is shown in the table below. Cordon pricing around downtown has received the most attention in the media and it may be the most direct way to prevent a significant rise in traffic once SR 99 tolls are implemented.

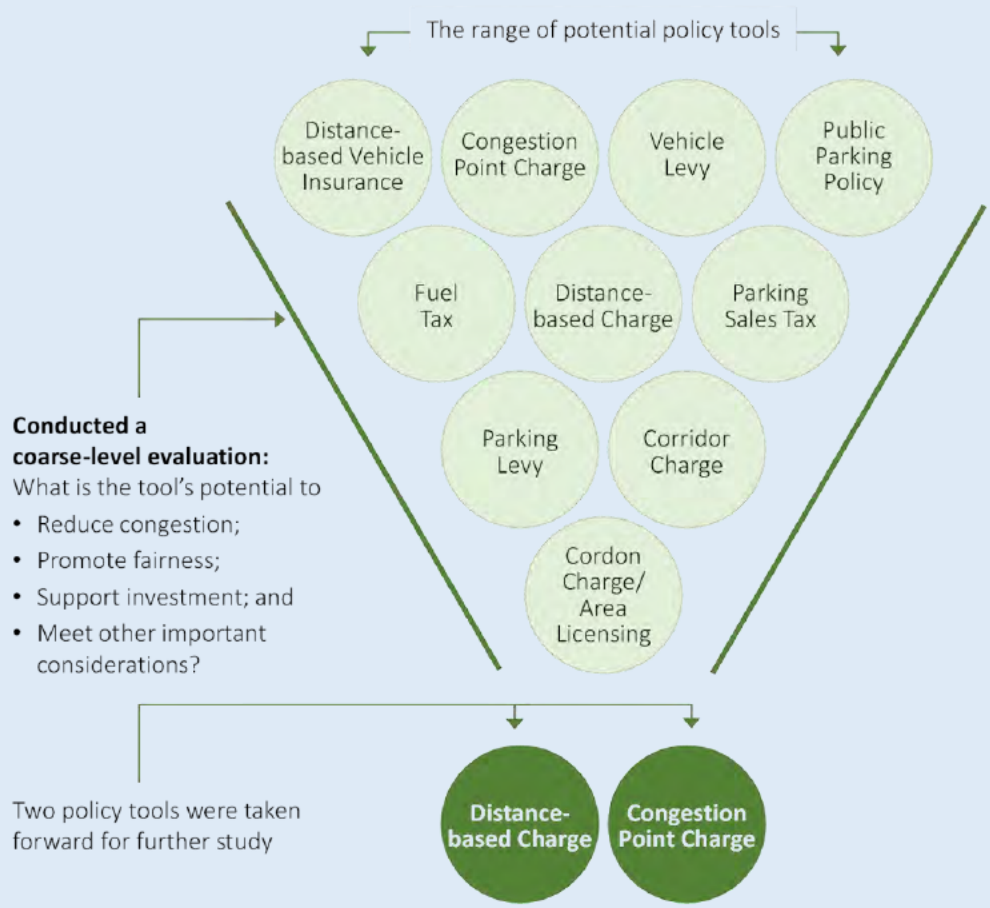
Pricing Tools Summary	
PRICING TOOL:	***DESCRIPTION:***
Cordon Pricing	Charge vehicles crossing the boundary into a cordon pricing zone
Area Pricing	Charge vehicles crossing the boundary and driving inside an area pricing zone
Fleet Pricing	Apply targeted pricing to specific vehicle types entering a zone, such as ride-hailing fleets or commercial vehicles
Connected/Autonomous Vehicle (C/AV) Zone	Create a zone that allows only licensed connected/autonomous vehicles
Fossil Fuel Free Zone (FFFZ)	Create a zone that only allows licensed non-fossil fuel vehicles, such as all electric and hydrogen vehicles
Road User Charge (RUC)	Charge vehicles based on miles traveled
Arterial Toll Roads	Price entire arterial roads
Arterial Express Lanes	Convert some lanes on arterial roads to tolled lanes
On-Street Parking Pricing	Vary street parking prices to control demand
Off-Street Parking Pricing	Apply a fee/tax to off-street parking facilities

During this first phase it will be necessary to narrow down the types of pricing that may be studied. This can be done by an initial screening of the impacts and benefits of the options above. The chosen options will then be subject, in 2019, to a more detailed analysis along the

lines of the Toolkit's step #3, *Determining benefits and burdens*. This is similar to the process Vancouver is employing, as described in the case study below.

CASE STUDY: Vancouver

Vancouver has mounting congestion, continued population growth, and two bridges that were tolled while others were not, leading some to drive extra distances to avoid the cost. While some type of bridge tolling or congestion charging seemed a likely outcome, Vancouver created an Independent Pricing Commission that studied a broad range of alternatives. They first adopted a set of transportation goals that included promoting fairness in transportation costs and impacts. They then evaluated which alternatives, if any, could best achieve their goals. After detailed analysis and community input, they settled on the two potential alternatives that seemed to be the best fit: distance-based charges and congestion point charges (similar in principle to cordon charges).



QUESTIONS TO ASK:	
1.4	Are there any additional pricing strategies that should be considered? *Put another way, does the list of project alternatives include all the options that best serve vulnerable communities? Have representatives of vulnerable communities provided input on measures, strategies and goals?*
1.5	Do the scope (and budget) of the planning study allow for a number of iterations so the equity strategies can be refined to best meet the goals and indicators?
1.6	Have we identified community priorities from existing studies that may be relevant?

Where: The geographic reach of the study

Road pricing can affect people living and working far from the facilities being studied. It is important at an early stage to set the project boundaries so that vulnerable populations that may be impacted are within the study area.

This initial phase will describe the possible locations of the project relative to the existing transportation network, the location of vulnerable populations, and key destinations. In future phases of study, the question of geography can become even more fine-grained, looking at not just key employment centers but the location of health care, religious, educational, retail, recreational, and public service facilities and how vulnerable communities that use those may be helped with new mobility options or other tools to mitigate any increase in costs.

While it's not possible for a study to include *every* commuter or traveler—some might be passing through from distant cities, for example—it is desirable to include as many as possible. The initial geographies are also important because they help to determine who should be the focus of the public engagement plan.

QUESTIONS TO ASK:	
1.7	Are all potentially impacted and vulnerable populations within the project study boundaries?
1.8	Do we know the other critical services that are regularly used by the relevant populations? Are these included within the study boundaries? *Examples of such services include shopping, medical care, education, religious, and recreation.*

ADDITIONAL RESOURCES

NCHRP's *Assessing the Environmental Justice Effects of Toll Implementation or Rate Changes: Guidebook and Toolbox* has a good introduction (pp. 9-18) to the eight kinds of road tolling or pricing actions that are typically considered, the kinds of impacts these are most likely to generate, and the initial identification of environmental justice issues. The checklists on pp. 366-372 are also useful summations of the important points to be considered in framing an impact study. It does not deal directly, though, with cordon or area pricing.

In addition, Tool 1, "Developing a Socioeconomic Profile and Community Characteristics Inventory for Environmental Justice Assessments," explains how the census can be used, including the kind of metrics available and the data tables that report those variables.

Two other equity toolkits are also worthwhile for the insights they provide. The Race & Social Justice Initiative's *Racial Equity Toolkit* was developed to help implement the vision of the Seattle Race and Social Justice Initiative.[7] Likewise, the Greenlining Institute's *Mobility Equity Framework: How to Make Transportation Work for People* is a guide to creating a more community-centered transportation planning process.[8]

PRICING EQUITY STEP #2

Define Equity Outcomes and Performance Indicators

Another important early part of project planning is defining the primary goals, referred to here as *outcomes*. It is important to then match these outcomes with *indicators*—the measures that we will use to gauge success or failure, and how the program can be evaluated and improved. These more detailed performance indicators help us answer the core question: does this project advance equity?

There are dozens of papers describing different types of equity in relation to congestion pricing.[9] These include overall ideas of fairness, such as by geography, not just those related to vulnerable communities. This white paper recommends a focus on two types: *Process Equity* and *Outcome Equity*.

For *Process Equity,* the key measure is the full participation of vulnerable communities in planning, implementation, and project follow-up. Process Equity is central to the long-term task of making transportation systems more equitable for all peoples, addressing *historical inequities* that continue to affect vulnerable communities.

Outcome Equity focuses on the actual *impact* of the program. TransForm recommends consideration of at least three dimensions of Outcome Equity:

1. Affordability;
2. Access to opportunities; and
3. Community health.

It is important to be clear on proposed outcomes as well as their relative priority, since some equity strategies (such as giving toll exemptions to different groups) may seemingly work against other project goals (such as reducing climate emissions and local air pollution).

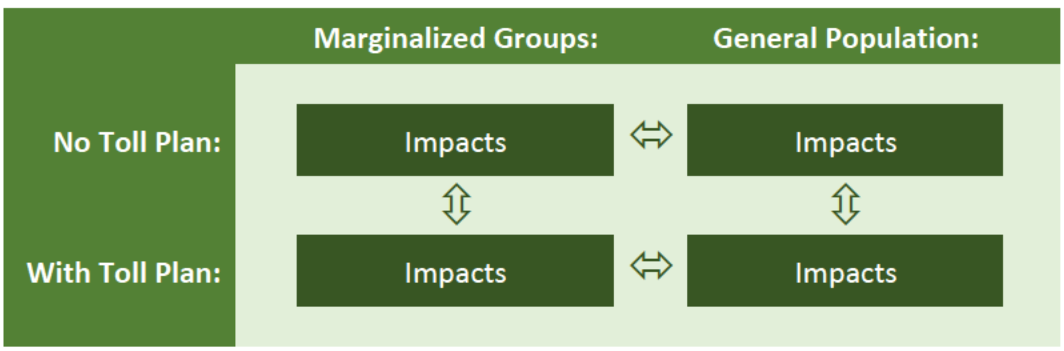
This section provides a short discussion of each of the four dimensions noted above. This is followed by a chart with some sample indicators for each dimension.

Note that most of these indicators—such as changes in transit ridership or the percent of toll revenue spent to benefit marginalized communities—can be predicted ahead of time using models and formulas. Later on, these indicators can also be used to monitor, evaluate, and

improve the program. While the methods and data to evaluate some indicators are imperfect, expensive to collect, and often time consuming, they are an important focus.

It is often useful to do *comparative analysis* in order to determine the real impacts of proposed changes in the transportation system. At its simplest, two kinds of comparative analysis are useful: ones comparing impacts from the road pricing proposal with what may be expected if road pricing is *not* adopted, and one comparing the impacts on vulnerable populations with the impacts on the general population. These projections are often made for when the project is first implemented and for one or more time points in the future (such as in 10 years and 25 years).

The following chart depicts these comparative analyses, with arrows showing where the comparisons take place:[10]



In addition to these comparisons, the study will also compare different pricing strategies against each other. For example, Vancouver calculated how much low-income, medium-income and high-income households might spend on different kinds of congestion pricing. People in high income households generally drive more, so were projected to pay more as an absolute dollar figure, but low income households would pay a larger percentage of their income. They calculated that, in order to ensure everyone paid the same proportion of their income as the high income households would, around 20 percent of the net revenues (between CD $170-345 million) would need to be returned to low income households through rebates, discounts or other measures. This measure can be used to compare how equitable – or inequitable – different kinds of charging are in practice.

These comparative analyses can be useful in highlighting unfair advantages or burdens at the group or "population" level. But, ultimately, it is also important to understand the real impacts—both benefits and burdens—on *individuals* in certain communities. How much will it cost for an individual who has no option but to drive during the peak? Are reasonable alternatives like transit readily available and useful? What are the alternative routes or times of day that low-income travelers might use to avoid the extra costs, and how burdensome would

the lost time or change in schedule be? Even if the number of such individuals is not large, the tolls may be a real burden for them with serious consequences.

Affordability

At the heart of the affordability question is: Will the proposed pricing project make transportation *more expensive* for some members of vulnerable communities? If so, by how much?

Given there will also be a stream of revenues that can be distributed, it is also important to ask if there are ways transportation can be made *more affordable.* Unlike sales taxes, fuel taxes, and many other transportation funding sources, toll programs can offer means-based affordability options that give discounts, set caps (the maximum amount that someone might need to pay), provide rebates or fully exempt certain drivers.

It is also possible to provide lower-cost alternatives, for example, expanding the breadth of the ORCA Lift fare discount, or deepening the discount (from the current half-price for those who qualify based on income[11]). ORCA Opportunity, for example, already provides free, unlimited transit for high school students, income-qualified middle school students at Seattle Public Schools, and Seattle Promise Scholars.[12] Seattle is also starting a low-income car-share program to provide income-eligible residents with discounted car share memberships and driving minutes.[13] While these are currently funded through other sources, many of these equity programs—and new ones—could be funded through a congestion pricing plan.

Expanded and faster transit options may also allow some people to reduce their overall transportation costs by reducing private vehicle use or even ownership. London added 300 buses to prepare for congestion pricing. Los Angeles started two rapid bus lines as part of their freeway Express lanes on I-10 and I-110, along with allocating 40% of ongoing net revenue to public transit improvements and 40% to bicycle and pedestrian safety.

Performance indicators should capture the impact and scale of pricing on all households from marginalized communities—both drivers and non-drivers. An excellent study of highway tolls in the Puget Sound Region was conducted in 2011 and shows how considering the full population, and not just those expecting to pay tolls or fees, is the appropriate analysis and is in accord with standard best practice in distributional studies of taxes.[14]

Evaluation will also look at how costs may vary by geography. The following table illustrates sample indicators to assess impacts on affordability.

Affordability

CATEGORY	*SAMPLE INDICATORS*
Discounts	• Discount level on tolls for low-income and other populations • Discounts on transit fares or other alternatives (subsidized by tolls)
Regressiveness	• Degree to which discounted tolls are regressive, and how much revenue redistribution is needed to make them progressive (or neutral, as was calculated by Vancouver) • Household budget spent on transportation, by income level (total amount and percentage of income) • Change in share of household income spent on transportation and housing, by income category
Participants	• Number of people from marginalized communities participating in (or eligible to participate in) discounted tolls or transit fares • Ratio of those who are eligible for the equity pricing programs (both for car drivers and for non-driving strategies like discounted transit) to those that have actually signed up
Subsidies	• Amount of toll revenue invested in transportation subsidies for marginalized communities (and as a share of total net revenue)
Savings	• Total expected savings from toll and other subsidy programs for marginalized communities

QUESTIONS TO ASK:	
2.1	**How will congestion pricing change affect the travel costs of low-income drivers and non-drivers?**
2.2	**How do we ensure that members of vulnerable communities have ways to overcome financial barriers to participation, including for the unbanked and for those who may have trouble putting up deposits for transponders or other required technologies?**
2.3	**Do we have enough data on travel patterns and the potential changes in travel behavior to understand the potential financial impact of the tolls?** *Would it be useful to complement that data with focus groups or surveys?*

Access to Opportunity

The purpose of the transportation system is to link people to all kinds of opportunities: jobs, education, health care, and social, recreational, and commercial activities. So the question of how a proposed pricing (or infrastructure) proposal may change *access* to these places is critical. A well-designed pricing strategy should increase access, especially for those that rely on public transit and drivers that find it worth the expense to use the priced facility or area.

There are two big areas of concern with regard to access. The first is for drivers from marginalized communities who may decide to detour to avoid the toll, creating both a time cost (essentially reducing their access), and potentially increased costs for gas and vehicle use. The second concern is whether the mechanics of toll payment restrict opportunity by creating barriers to use; for example, requiring drivers to front sums of money (e.g., for transponders or prepaid tolls) or to have a credit card or bank account to link to their accounts.

Access to Opportunity	
CATEGORY	***SAMPLE INDICATORS***
Funding	• Absolute dollar amount invested in transit and mobility options in/that benefit marginalized communities including: ➢ New transit routes ➢ Increased frequency ➢ Subsidies for vanpools, new mobility options, etc. • Percent of funds from tolls spent supporting expanded mobility options that benefit marginalized communities.
Service Quality	• Changes in transit speed, reliability, and quality that directly impact marginalized communities. • Changes in travel speeds and/or reliability for cars, HOVs, and those paying tolls.
Service Levels	• Number of new transit miles, routes, or transit vehicle levels that benefit marginalized communities.
Transit Use	• Increase in marginalized people's transit ridership attributed to transit investments. • Increase in the number of riders that use discounted fares each year.
Ratios	• Number of marginalized people paying the toll compared to those that change routes to avoid the toll (note: this information requires extensive surveys). • Amount of investment in marginalized communities vs. other communities.
Access	• Change in the number of jobs, services, etc., that marginalized communities can access within a 30 or 45 minute window, by mode.

QUESTIONS TO ASK:	
2.4	Are key community destinations being analyzed and are any missing?
2.5	What alternative transportation choices (roads, transit, etc.) will be available to those who cannot afford the toll? For those who are likely to drive alternate routes, what is the time penalty?
2.6	Are potential benefits being fully considered (e.g., the potential increase in bus

speed), both when the project is implemented and further into the future?

Community Health

Low-income populations and populations of color have historically borne a greater share of the negative health impacts of transportation systems. Freeways were often built through lower-income and minority communities, imposing higher levels of asthma and other health impacts of air pollution and noise. Lack of infrastructure means marginalized communities also have higher death and injury rates from walking and bicycling.[15]

Pricing strategies can be a way to minimize some of these impacts, by reducing the amount of overall driving taking place, by reducing the need to expand roads and freeways, and by creating revenue streams that can support bicycle and pedestrian infrastructure or clean vehicles.

Community Health	
CATEGORY	*SAMPLE INDICATORS*
Infrastructure	• Absolute dollar amount of funds spent on bike and pedestrian improvements in marginalized communities. • Miles of effective/safe bike lanes and sidewalks added or improved.
Funding	• Percent of toll revenues spent on bike and pedestrian improvements in marginalized communities.
Safety	• Change in collisions, death, and injury rates due to traffic reduction on facilities that receive investment.
Trips	• Change in the number of bicycle and pedestrian trips.
Air Quality	• Percentage of new clean air buses, funded as part of the toll investment strategy, in vulnerable communities. • Change in particulate matter or other criteria pollutants in identified impact areas.
Health	• Anticipated health benefits, disease reduction, and improvements in life expectancy (can be predicted using ITHIM or another model).

QUESTIONS TO ASK:	
2.7	Do the main health indicators include the ones that were prioritized by marginalized communities?
2.8	Is data on health impacts detailed enough to ascertain impacts on residents within a short distance of the tolled facility and/or other impacted roadways?
2.9	What changes in air pollution are expected? *Where do these occur? Who do they affect?*
2.10	What impacts on bicycle and pedestrian safety are projected?
2.11	Will changes resulting from road pricing reduce traffic and bring more community cohesion? *Would pricing further isolate some communities or particular populations?*

Full Participation

Process equity is focused on participation in the planning and decision-making process. Since low-income groups and communities of color have historically been disenfranchised from full participation, the issue is how to ensure that the views and concerns of these communities, *as*

community members understand and articulate them, are fully solicited, valued, and reflected throughout the process.

The following chart depicts the kinds of activities associated with greater degrees of involvement. This is followed by a table of sample indicators for participation, as well as a table with questions to ask.

Increasing Degree of Participation →					
Level	**Minimal**	⟷			**Maximum**
Public Participation Goal	Marginalized communities are provided information on the project.	Marginalized communities provide feedback to the goals.	Solicitation of public concerns and aspirations is ongoing.	Agencies closely partner with community groups throughout the project.	Marginalized communities have a seat at the decision-making table.
Sample Outreach Strategies	• Fact sheets • Websites • Open houses	• Public meetings • Public comment • Focus groups • Surveys	• Workshops • Deliberative polling	• Advisory committees • Consensus building • Participatory decision-making	• Resident juries • Ballots • Delegated decisions • Formal representation on decision-making groups

Based on NCHRP and the International Association of Public Participation

Full Participation	
CATEGORY	***SAMPLE INDICATORS***
Activities	• Number of meetings and focus groups with marginalized communities. • Dollar amount and/or percentage of project budget dedicated to equity outreach programs.
Communications	• Number of languages into which materials are translated. • Share of principal languages spoken in the community into which materials are translated. • Number of ethnic media outlets that receive information and publish articles about the proposal, or are targeted for advertising community meetings.
Organizations	• Staff time dedicated to technical support and funding to Community-Based Organizations (CBOs) to conduct/participate in needs assessment.

Participants	• Number of individual voices that have contributed to the community needs assessment.
Responsiveness	• Number of community-identified priorities that are being implemented as part of the program.

QUESTIONS TO ASK:	
2.12	**Where is the planning process on the "Degree of Participation" scale?** *Does it need more resources or political support to move further right on the spectrum?*
2.13	**Are the efforts planned to reach vulnerable populations likely to reach people where they are, or do they expect people to come to planning events?**
2.14	**Are the comments and priorities of marginalized communities being actively catalogued?** *Are there plans to address these priorities in a clear and transparent way?*

ADDITIONAL RESOURCES

Assessing the Environmental Justice Effects of Toll Implementation or Rate Changes: Guidebook and Toolbox has several lists that are useful for additional perspective:

- A checklist for understanding the role of quantitative and qualitative performance indicators (pp. 358-359).
- Table 3 (pp. 135-138), "Practical approaches for reaching low-income, minority, and other traditionally underserved populations," presents an agency-level perspective on reaching members of vulnerable populations.

The Greenlining Institute's *Mobility Equity Framework* identifies 12 Equity Indicators which it recommends for equity studies (pp. 11-13).[16]

PRICING EQUITY STEPS #3-5

3. Determine Benefits and Burdens

Once a set of *performance indicators* is adopted, the project team will conduct studies to determine the impacts of the proposed alternatives. The analyses that will go into determining benefits and burdens should be tailored to the *scale* of impacts, community *interest* in those impacts, and the *potential* of those impacts to help or hurt vulnerable populations.

There will likely be an iterative process between this stage and the previous two stages. Results of the analysis will both inform further development of the proposal, and raise new angles in the understanding of the equity impacts, requiring new or amended indicators. International experience suggests that five or more iterations may be necessary.

4. Choose Programs to Advance Transportation Equity

The purpose of this stage is to identify which set of policies and measures can best maximize equity across all groups and minimize the harm to vulnerable populations. Some of the most relevant strategies may already have been identified and even implemented (in part or in full) in local or regional plans or in community group transportation recommendations for other projects.

5. Provide Accountable Feedback and Evaluation

Road pricing strategies, once implemented, will lead to shifts in travel behavior; pricing revenues will also begin to flow to programs and efforts aimed at improving equitable outcomes. The nature of pricing also allows for charge levels, time periods, discounts and – to an extent – charge locations to be adjusted to maintain and maximize positive outcomes and address issues that emerge. Ongoing monitoring and evaluation can help identify problems or issues that may emerge, as well as point to new opportunities to help advance equity.

SDOT will need to ensure that:

- Monitoring and evaluation occur along a reasonable timeline.
- There are agreed-upon mechanisms for providing feedback to the community and decision-makers on both the successes and shortcomings of the program, as well as to highlight and act upon emerging opportunities.
- The results of monitoring and evaluation are communicated clearly and consistently with affected communities.

General Equity Impacts of Different Pricing Strategies

At the very highest level, the following chart gives a sense of how a pricing strategy can be inequitable and the different strategies that can make it more equitable or even advance an equity agenda. The "investment strategy" column primarily refers to the allocation of funds generated by congestion pricing, although these funds may be complemented by other sources.

CORDON PRICING EQUITY MATRIX		
STRATEGY	***INVESTMENTS***	***EQUITY IMPACTS***
24-hour **Flat-rate pricing**	Road expansion. New transit is not particularly focused on vulnerable communities.	Likely to be most regressive strategy, charging low-income drivers who often don't commute at peak commute hours. Not very efficient at increasing vehicle and transit speeds. Investment strategy doesn't add more affordable options.
Dynamic pricing that varies with time or congestion	Mix of road expansion and transit that serves vulnerable communities.	Efficient charging system but is regressive (though likely less regressive than gas and sales taxes). Drivers can potentially shift modes to new more affordable modes.
Dynamic pricing with some means-based discounts	Primary focus on transit, walking, and bike infrastructure. Targeted carpool, vanpool, and new mobility options, especially where transit is thin.	Less regressive due to discounts. Investments allow greater shift to more affordable modes and address community health.
Means-based pricing with targeted caps and/or exemptions	Similar investments as above but with an intensive focus on vulnerable communities. Additionally, fares are reduced on transit and	System designed specifically not to be regressive, becomes even more affordable for some. Some loss of efficiency as plentiful discounts, caps and exemptions may limit the congestion and climate benefits.

	other mobility options.		Significant expansion of commute options further increases overall transportation affordability.

Notes

[1] Martin Wachs, in his history of transportation planning in Los Angeles, notes that LA had for decades planned a relatively balanced set of modal investments, with transit an important component, but the US Federal Interstate Highway Act led to most local and state transportation funds going to freeway building. Martin Wachs, "The Evolution of Transportation Policy in Los Angeles: Images of Past Policy and Future Prospects," in Allen J. Scott and Edward Soja, eds., *The City: Los Angeles and Urban Theory at the End of the Twentieth Century* (Berkeley and Los Angeles: University of California Press, 1996), 106-159.

[2] Mikayla Bouchard, "Transportation Emerges as Crucial to Escaping Poverty," New York Times (New York, NY, 6 May 2015), p. A3. This article provides a clear summation of the research report, which is otherwise highly technical.

[3] American Public Health Association, "Improving Health through Transportation and Land-Use Policies," policy statement (10 November 2009), www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/07/31/08/21/improving-health-through-transportation-and-land-use-policies. Accessed 18 October 2018.

[4] King County Public Health Community Health Needs Assessment: Available at: https://www.kingcounty.gov/depts/health/data/community-health-indicators/~/media/depts/health/data/documents/2018-2019-Joint-CHNA-Report.ashx

[5] City of Seattle, Office of Sustainability and Environment. 2014 Seattle Community Greenhouse Gas Emissions Inventory (August 2016). Available at: https://www.seattle.gov/Documents/Departments/OSE/ClimateDocs/2014GHG%20inventorySept2016.pdf

[6] A 2008 study gave 275 household in Seattle a cash sum to spend on driving trips. With equipment to monitor driving they were charged tolls linked to traffic congestion levels, and at the end of the study they could keep money they did not spend. The results showed that pricing affected behavior: travelers altered their schedules, took different routes or collapsed multiple trips into single journeys. The agency in charge showed that if these tolls were implemented regionally they'd dramatically reduce congestion at peak time and increased average travel speeds. Yet the tolls would have to be quite high in some places to achieve that result. Eric Pryne, "Wide use of tolls could unclog roads, Seattle study says," Seattle Times (24 April 2008), www.seattletimes.com/seattle-news/wide-use-of-tolls-could-unclog-roads-seattle-study-says/. Accessed on 2 October 2018.

[7] http://www.seattle.gov/civilrights/programs/race-and-social-justice-initiative/racial-equity-toolkit

[8] greenlining.org/publications/2018/mobility-equity-framework/

[9] A particularly useful paper is Brian Taylor, "How Fair is Road Pricing? Evaluating Equity in Transportation Pricing and Finance," (National Transportation Policy Center, 29 September 2010).

[10] Adopted from National Cooperative Highway Research Program (NCHRP), *Assessing the Environmental Justice Effects of Toll Implementation or Rate Changes: Guidebook and Toolbox* (Washington, DC: National Academies Press, 2018), p. 56.

[11] www.seattle.gov/transit/orca-lift. Accessed on 2 October 2018.

[12] www.seattle.gov/transit/orca-opportunity. Accessed on 2 October 2018.

[13] www.seattle.gov/transportation/projects-and-programs/programs/transportation-equity-program. Accessed on 2 October 2018.

[14] Richard D. Plotnick Et al., *A Geography-Specific Approach to Estimate the Distributional Impact of Highway Tools: An Application to the Puget Sound Region of Washington State*. National Institutes of Health, Author Manuscript, August 7, 2011.

[15] People of color and the poor are overrepresented in active transportation fatalities and serious injuries in Washington State. From 2013 to 2017, about 59% of fatal and serious injury crashes in Washington occurred in geographic areas with a rate of poverty higher than the state average, despite these areas only accounting for 43% of the population. People living in poverty include an over-representation of people of color, the elderly, and

people with disabilities. From 2013 to 2017, American Indian or Alaska Native people represented 2% of the total population yet accounted for 6% of active transportation traffic fatalities in Washington. From: WSDOT's Active Transportation: Annual Safety Report http://wsdot.wa.gov/publications/fulltext/graynotebook/gray-notebook-Mar18.pdf

[16] Hana Creger, Joel Espino, and Alvaro S. Sanchez. *Mobility Equity Framework: How to Make Transportation Work for People* (Oakland, California: Greenlining Institute, 2018).

Seattle Department of Transportation

CONGESTION PRICING STUDY

DRAFT OPPORTUNITY STATEMENTS

Source: Oran Viriyincy

JANUARY 2019

Seattle Department of Transportation

DRAFT

SO WHY PRICING, AND WHY NOW?

WHAT?

Seattle is exploring congestion pricing as a way to help address traffic congestion and reduce greenhouse gas emissions.

WHY?

Traffic congestion is costing us. We spend more time commuting than most other cities our size, at a cost of $5 billion each year.[1] Our transportation system is the greatest contributor to greenhouse gas emissions—66% of emissions citywide come from transportation.[2]

HOW?

Our approach to developing and implementing a pricing program will be **equitable**, **transparent**, and **responsive**.

GROWTH

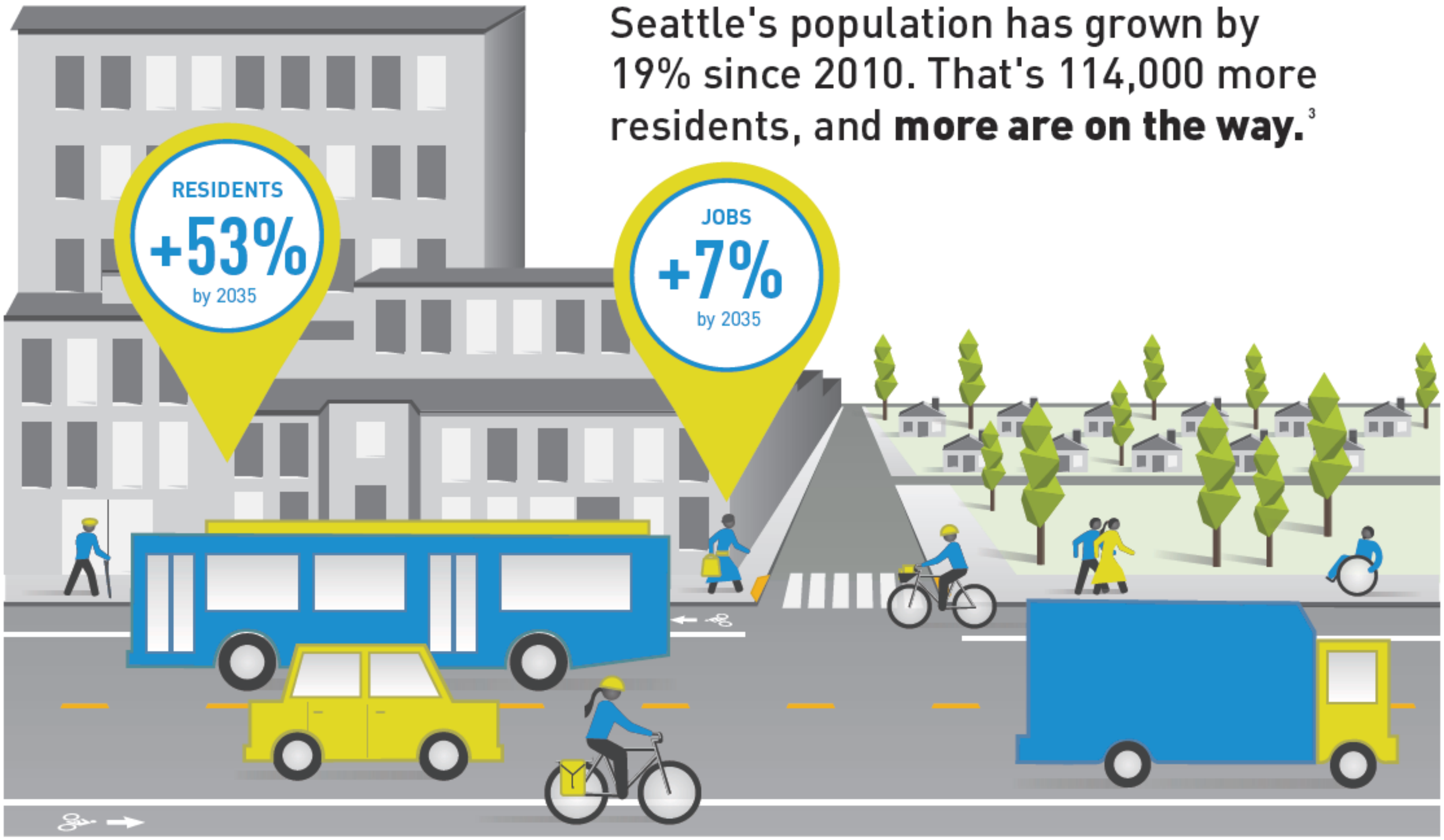
CHALLENGE

Seattle has ranked in the top four for growth among major U.S. cities for five years in a row. Growth isn't stopping, and there is no space in Center City to build new streets.

OPPORTUNITY

To move more people and goods in the same amount of street space, we can promote more efficient travel behaviors and expand travel options such as transit and shuttles.

Seattle's population has grown by 19% since 2010. That's 114,000 more residents, and **more are on the way.**[3]



EQUITY

With Seattle's growth comes pressures on housing and overall affordability. Some people are being priced out of the city and forced to move further from jobs and services.

CONGESTION

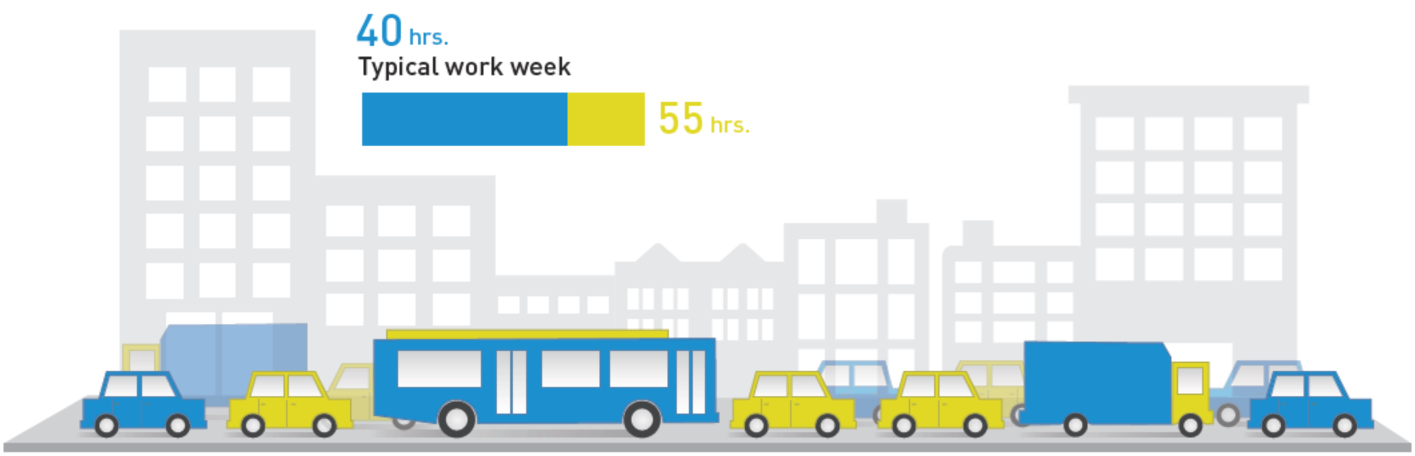
CHALLENGE

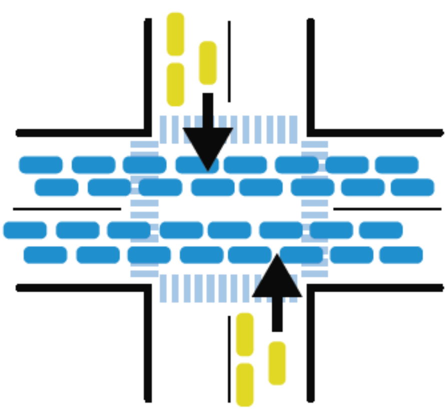
Seattle is ranked as the fourth most congested U.S. city.[4] With no space for new streets, we need to innovate or gridlock is going to get worse.

OPPORTUNITY

By lowering the share of people driving alone to and through Center City, and shifting trips to other times of day, we can free road space for other uses.

People and goods spend
55 hours per year in traffic.[5]





Daily, there are 1,000 incidents of **"blocking the box"** and gridlocking at intersections.[6]

EQUITY

People that can't afford to live near their jobs or don't have access to transit often have no option except to drive when traffic is heaviest.

PRODUCTIVITY

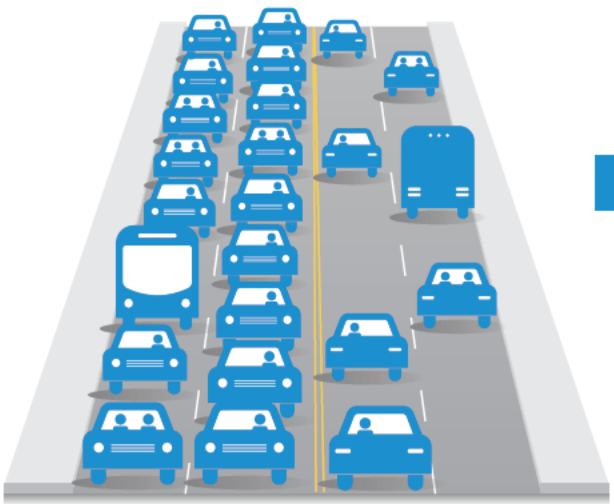
CHALLENGE

There is a significant economic cost associated with people and freight spending time stuck in traffic in Seattle.

OPPORTUNITY

Pricing is one tool that can help businesses prosper and ensure we get to the places we are going and to the people we love on time.

In 2017, the time spent in Seattle traffic is estimated to have cost **$5 billion in lost productivity.**[7] That is equivalent to **10 times Seattle's entire transportation budget** in 2018.[8]



$5 billion
in lost productivity

This equals

10x

SDOT's total budget and 5x the current bridge maintenance backlog

EQUITY

People with hourly wage jobs or more than one job experience disproportionate impacts from unreliable traffic patterns.

TRAVEL TIMES

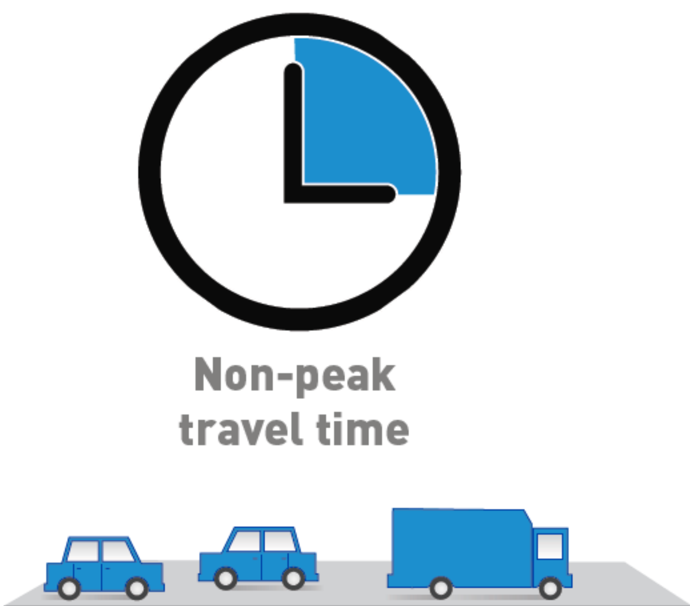
CHALLENGE

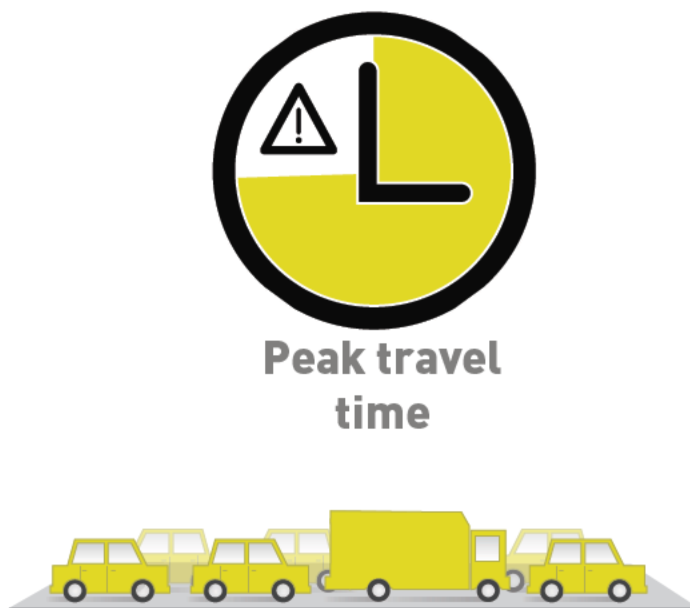
Overall travel times are increasing on most corridors in the Puget Sound region, particularly during the afternoon commute. This can slow the most efficient travel options that move more people, including the 37% of commuters on a bus.[9]

OPPORTUNITY

Traffic that flows more reliably helps to get people and goods where they need to go on time, any time of day. Trips can be faster for both drivers and people riding transit.

Average travel times to or through Seattle on I-5, the SR 520 bridge, and the I-90 bridge **triple during the afternoon peak.**[10]





EQUITY

Unpredictable travel times can compromise quality of life and job security, especially for people who work multiple jobs or who have fewer travel options.

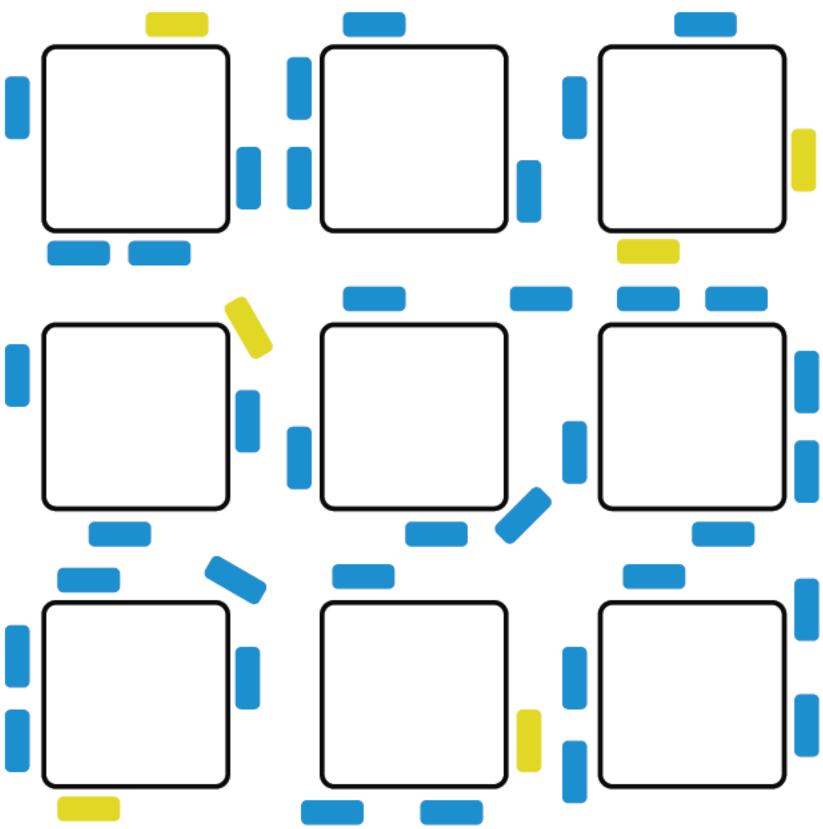
EMERGING TECHNOLOGIES

CHALLENGE

New technologies are changing how people and goods travel in Center City. Shared mobility options are growing, and autonomous vehicles (AVs) are on the horizon.

OPPORTUNITY

We can proactively manage street and curb space to avoid an influx of empty, circling cars, ensuring that modes moving the most people have priority, and are accessible to everyone.



Nearly 10% of circling traffic in Seattle is **ride-hailing vehicles** (Lyft, Uber, and taxis).[11]

EQUITY

New mobility services contribute to the congestion that some drivers have no option to avoid. These services are often inaccessible to people who don't have smartphones or bank accounts and those with limited English proficiency.

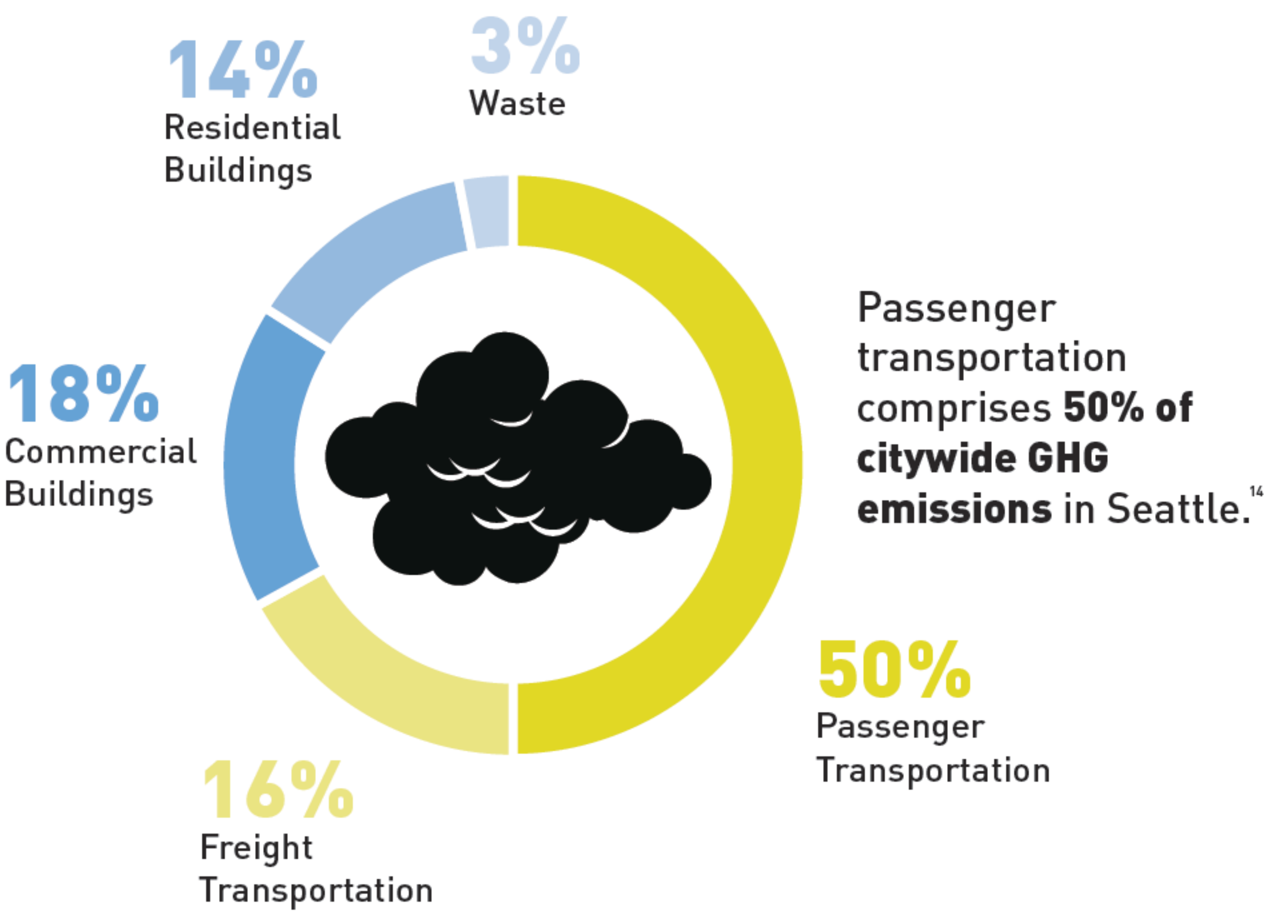
ENVIRONMENT

CHALLENGE

Seattle is among the top four cities in the U.S. with an increasing number of pollution spikes.[12] Road transportation remains the largest contributor to Seattle's greenhouse gas emissions.[13]

OPPORTUNITY

If we act now, we can curb emissions and reduce vehicle miles traveled to help Seattle meet its goal of becoming carbon neutral by 2050, and supporting the Paris Agreement's commitment to limit global warming to 1.5 degrees Celsius.



EQUITY

Seattle's worst air quality areas are also in communities of color, and King County households with annual incomes less than $15K experience rates of asthma nearly two times those of households with incomes above $50K.[15,16]

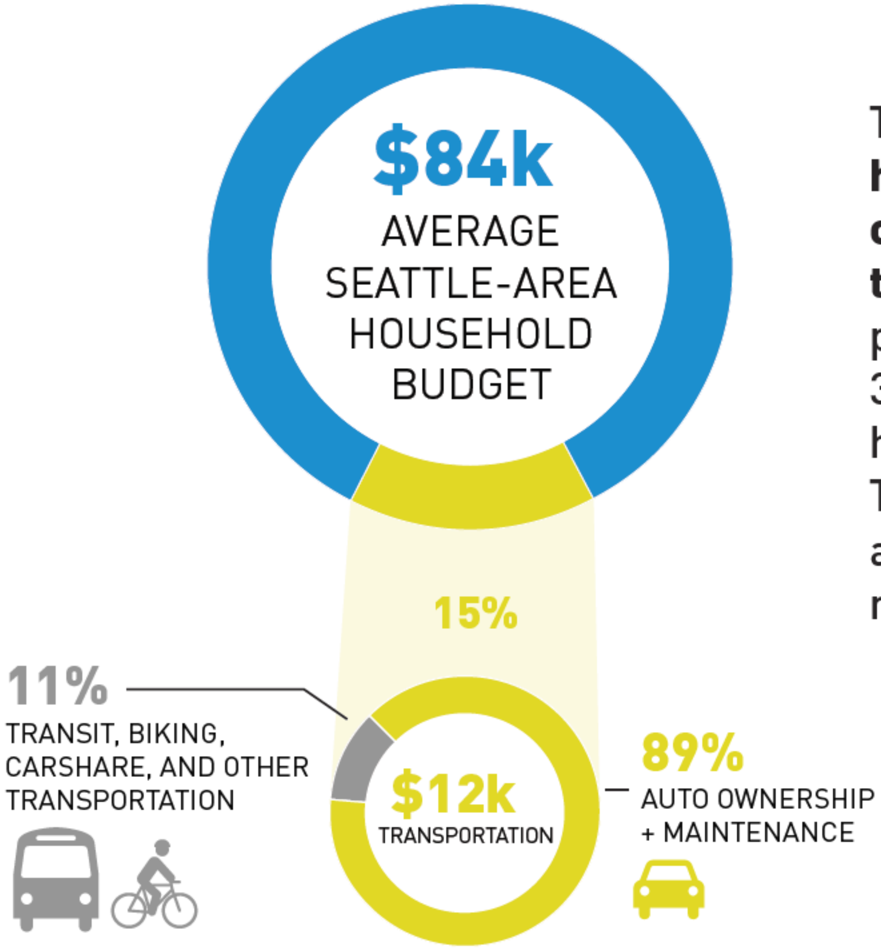
AFFORDABILITY

CHALLENGE

Our city is becoming increasingly unaffordable for many. The high cost of living has caused displacement, meaning more people are moving further from Center City jobs to find more affordable housing, and now face long, slow commutes.

OPPORTUNITY

With good travel options, car ownership can become a choice rather than a necessity. Investing in transit, street safety, and infrastructure that supports more efficient and sustainable travel options can reduce the amount of income people spend on transportation.



The average **Seattle household spends 15% of its budget on transportation.**[17] That percentage can be up to 30% for low income households.[18] Transportation is less of a financial burden for residents without cars.

EQUITY

Households with lower incomes spend a greater proportion of their budget on transportation, especially if they require a car.

HEALTH AND SAFETY

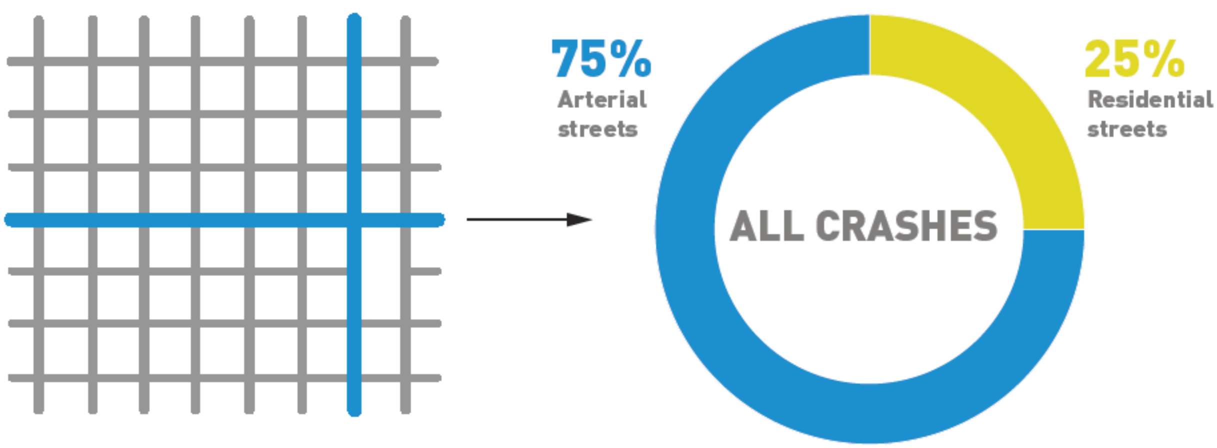
CHALLENGE

Congested streets contribute to air and noise pollution, stress, and traffic collisions. Crashes are more likely to occur when speeds vary along streets where high volumes of traffic—whether cars, bikes, people walking, or buses—merge.

OPPORTUNITY

Promoting more consistent travel speeds and making intersections safer in our busy corridors can help to reduce conflicts and improve safety for growing numbers of people.

3 out of 4 crashes in Seattle occur on arterial streets where traffic volumes are often highest. Center City is also where most pedestrian and bicycle crashes take place, in part due to greater exposure of people walking and biking.[19, 20]



1/3 of Seattle streets are arterials; our primary transportation corridors

3/4 of crashes take place on arterial streets

EQUITY

Congested streets put vulnerable travelers at a greater risk of collision and injury. People of color, older adults, and people who earn lower incomes are disproportionately represented in walking and biking fatalities.[21]

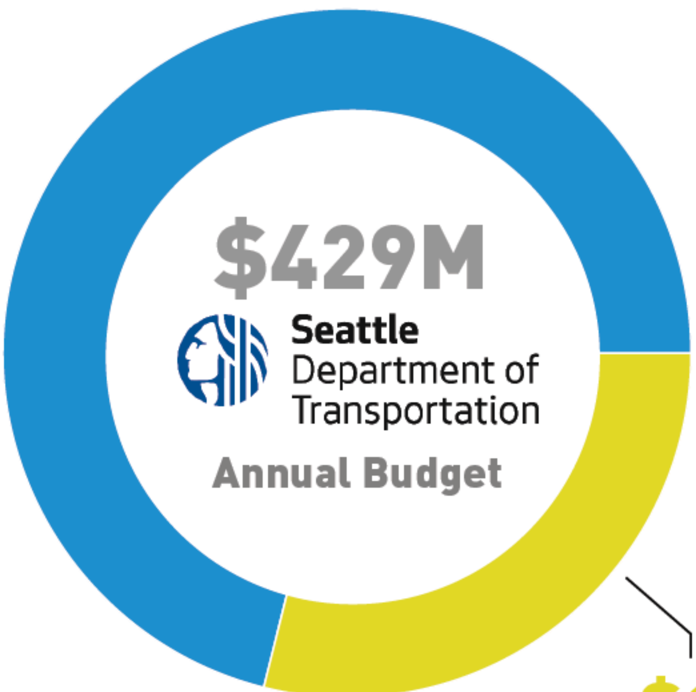
INFRASTRUCTURE

CHALLENGE

Seattle's streets, highways, and bridges struggle to accommodate our growing traffic, adding wear-and-tear to aging infrastructure.

OPPORTUNITY

Keeping our transportation system in a state of good repair will help Seattle stay affordable by lowering the cost of future maintenance. Allocating resources to support infrastructure for efficient and affordable travel options—especially transit—will create a more equitable and sustainable Seattle.



In 2015, approximately 29% of the department's budget was devoted to maintenance of existing infrastructure. Transit and HOV capital and operations cost approximately $26M, just 6% of the total budget.[22]

$123M
SDOT Annual Maintenance Budget

EQUITY

Sales and property taxes to pay for streets and roadways disproportionately burden people with lower incomes.[23]

CONCLUSION

A well-desigined pricing program can help to support equitable, efficient, and affordable travel and improve our quality of life.

ENDNOTES

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Seattle Department of Transportation

01.2019

DRAFT CONGESTION PRICING IMPACTS AND BENEFITS WHITE PAPER

INTRODUCTION

The purpose of this white paper is to provide a high-level description of what is currently understood about the potential impacts and benefits of implementing a congestion pricing program in Seattle. It begins with baseline conditions data, describing local and regional travel patterns that could be affected by congestion pricing. It discusses some of the programs already in place to reduce travel demand in congested areas and during congested times. The paper then reviews lessons learned from evaluating mobility pricing efforts in Seattle and around the world.

The remainder of the paper is dedicated to the high-level evaluation of select mobility pricing tools, focusing primarily on area pricing, as the evaluation of select impacts and benefits can be accomplished with readily available data. The paper also describes data still needed and proposed methods for further evaluation of additional pricing tools.

BASELINE CONDITIONS

Both within the City of Seattle and the central Puget Sound region, travel patterns are heavily oriented to Seattle's center city area. Each weekday, approximately 250,000 people travel to or through central Seattle, approaching from the north (91,000), east (64,000), south (70,000), and west (24,000).[1] Commute patterns within Seattle are also heavily oriented to the center city. Figure 1 shows commute flows between Puget Sound Regional Council (PSRC) forecast analysis zones (FAZs) using 2015 Longitudinal Employer Household Dynamics (LEHD) Origin-Destination Employment Statistics (LODES) data.

While commute trips into center city originate from all parts of Seattle, the residential density of center city workers is greatest in census blocks in or near the downtown core (see Figure 2).

The concentration of employment in Seattle's center city leads to traffic congestion on local and regional roadways, as shown in Figure 3 and Figure 4.

[1] City of Seattle traffic data from 2016 and 2014 for arterials and WSDOT 2017 data for state roads and freeways

Figure 1 Commute Flows within the City of Seattle

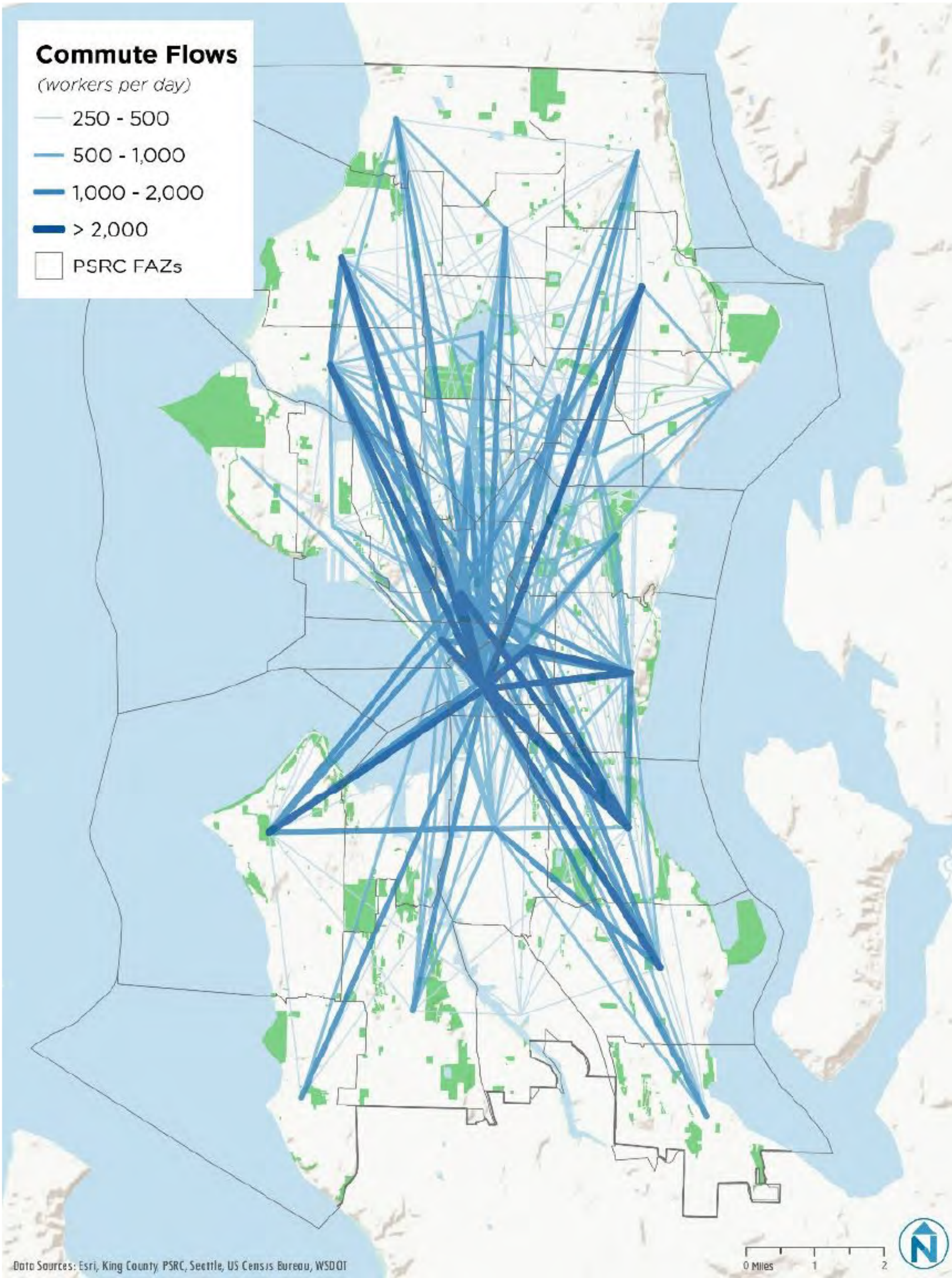


Figure 2 Residence Areas of Workers Employed in Center City

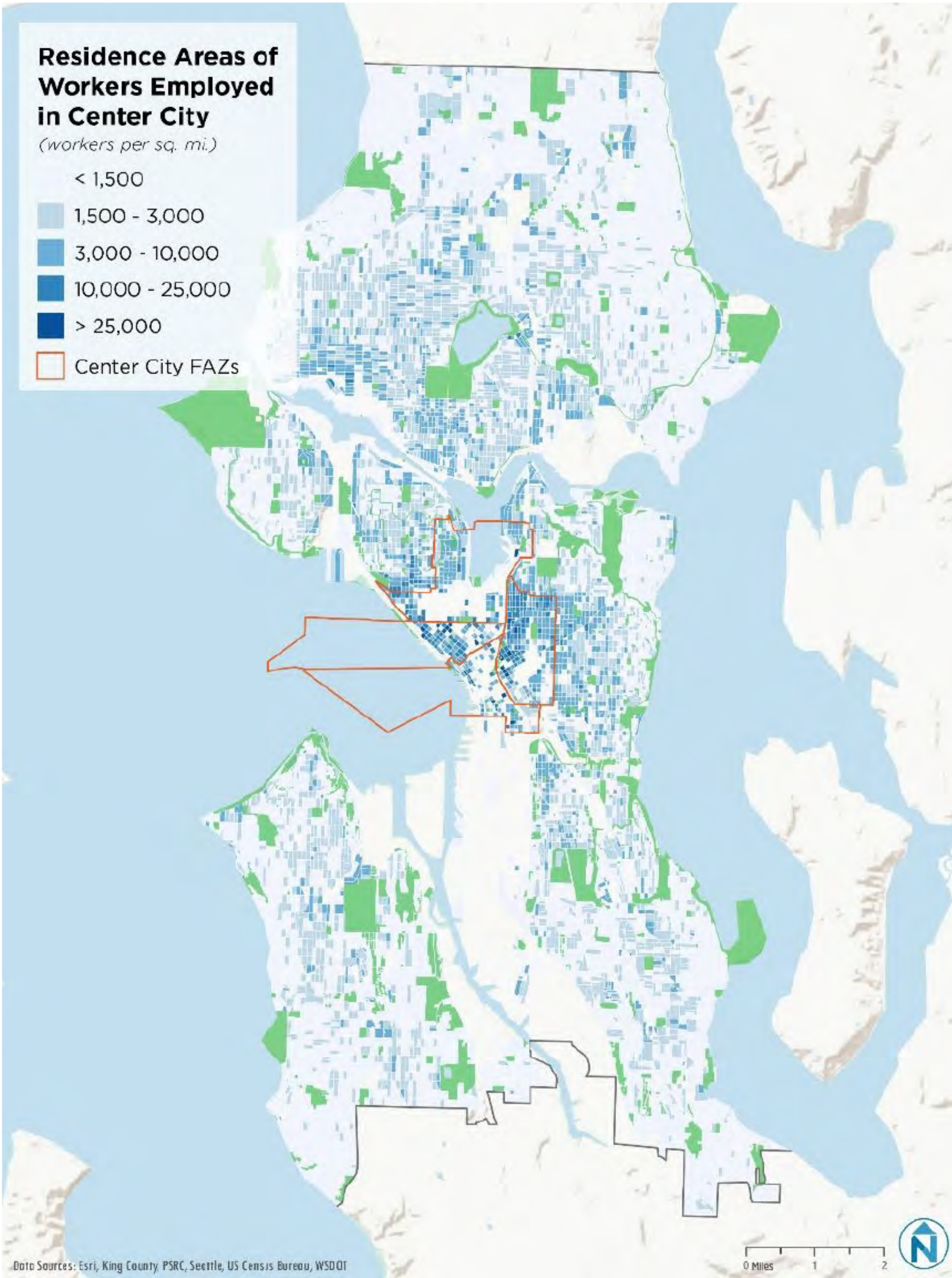


Figure 3 Average Annual Weekday Traffic on Seattle and Area Roadways

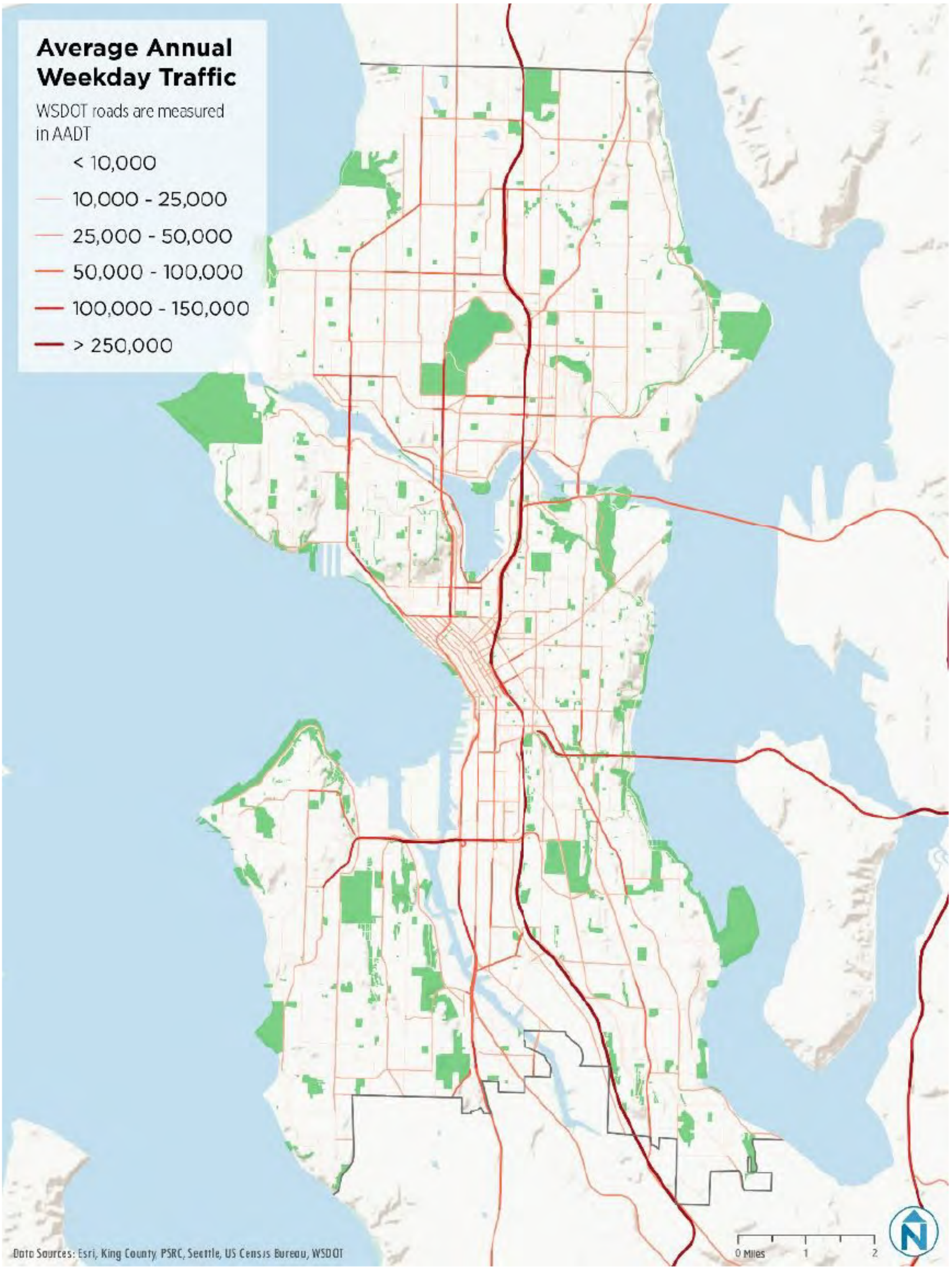
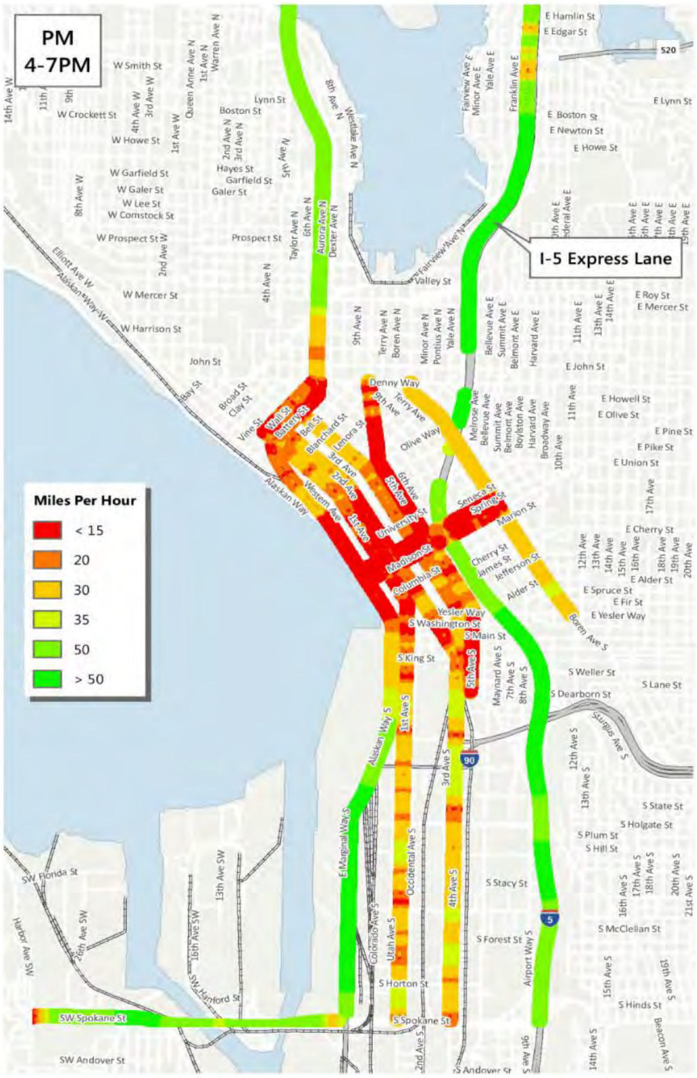


Figure 4 Travel Speeds Leaving Downtown Seattle (PM Peak)



Source: WSDOT SR-99 Tolling Study

Public Transportation Access

While the region's public transportation network is also heavily oriented toward the center city, with significant amounts of weekday peak-period commuter service from throughout the region into (or out of) downtown, there are areas of opportunity for better connections to center city employment and activities, especially in terms of creating a more equitable system.

Figure 5 shows low-income household density in Seattle, overlaid with the existing and future frequent transit network. Most areas with a higher density of low-income households have access to frequent transit service, though some gaps remain. An interesting comparison is provided by Figure 6, which shows density of zero-vehicle households in Seattle (again with the frequent transit network overlay). This figure suggests that low-income households are not a proxy for zero-vehicle households, with many higher density areas of low-income households having lower zero-vehicle rates. Zero-vehicle households appear to be more closely associated with proximity to

the center city and the University of Washington, areas that have both priced and/or limited parking options and abundant transit service. This is relevant to the evaluation of congestion pricing impacts and benefits because it suggests that low-income residents to the north and south of downtown Seattle are owning vehicles out of necessity and therefore may experience greater negative impacts due to the pricing of roadways or vehicle use.

Figure 5 Low-Income Households and Frequent Transit Network in Seattle

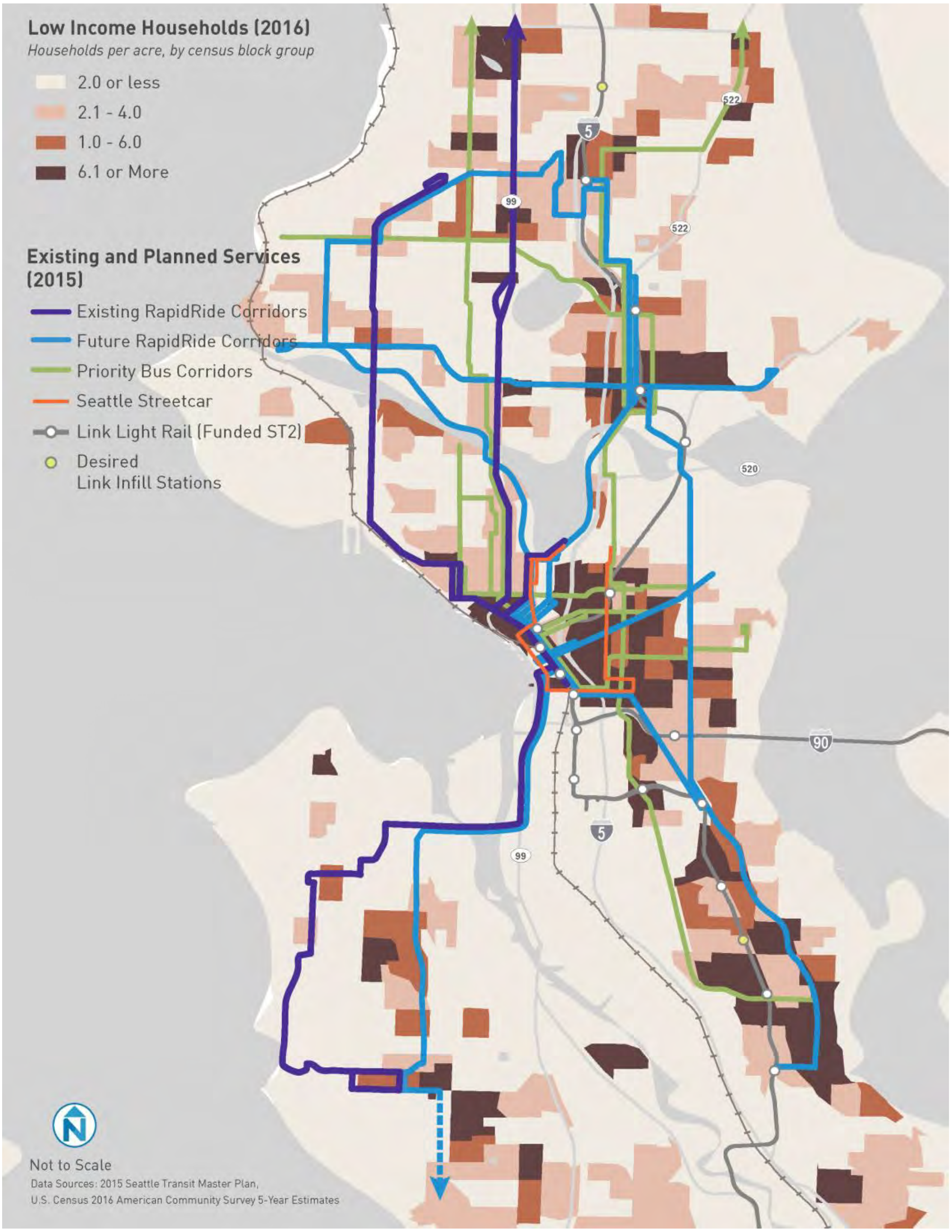
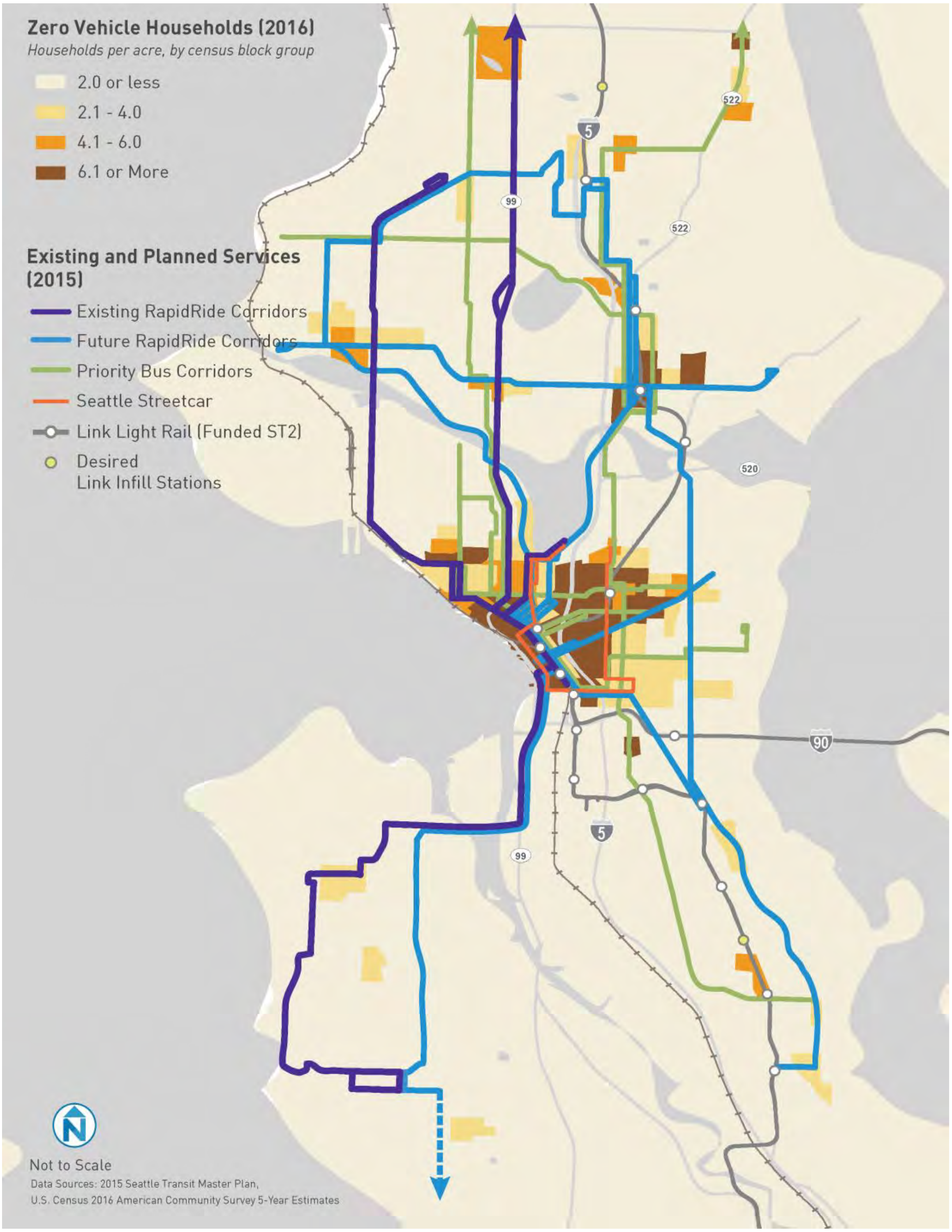


Figure 6 Zero-Vehicle Households and Frequent Transit Network in Seattle



TRANSPORTATION EQUITY

As discussed in the Pricing and Equity White Paper, historical transportation policies and investments have helped to create and uphold racial and social inequalities by favoring those with the resources to own and operate private vehicles. The City of Seattle is considering congestion pricing as a tool to help address climate change, and also as a tool that can help to make the transportation system more equitable by using new revenues to provide people with additional options other than driving alone (such as improved transit service). This study comes in the wake of successful efforts by the City and region to improve transit access and internalize some of the private costs of transportation through the following programs:

- Parking and curb space policies: Seattle is a leader in parking pricing and management of high-demand public right-of way including curb space and on- and off-street parking.
- Transportation demand management: Seattle's employer commute trip reduction efforts have led to a 10% decrease in drive-alone mode share and corresponding increases in transit and active commute modes to center city jobs between 2010 and 2017.[2] The citywide drive alone rate has decreased by 5% over the same period.
- Seattle Transportation Benefit District: In 2014, Seattle voters chose to fund additional transit service and other transit programs in Seattle, helping to contribute to increased transit service and higher transit ridership throughout the city.
- ORCA LIFT and ORCA Opportunity Programs: In 2015, King County Metro, Sound Transit, and other regional transit providers implemented a low-income fare rate available on the regional fare card, One Regional Card for All (ORCA), called ORCA LIFT. The program offers reduced fares for people whose household income is less than double the federal poverty level. Seattle also implemented the ORCA Opportunity program (formerly Youth ORCA program) to provide free ORCA passes to high school students at Seattle Public Schools.

The evaluation of congestion pricing tools continues Seattle's efforts to create a more equitable transportation system. The Pricing and Equity White Paper recommends approaches that can be taken to ensure that community voices are included in the discussion, with a goal that any recommended congestion pricing program improve rather than exacerbate inequalities in the transportation system.

LESSONS FROM LOCAL AND INTERNATIONAL MOBILITY PRICING EFFORTS

This white paper does not provide a full evaluation of lessons learned from other cities' mobility pricing studies and programs; rather, it identifies high-level evaluation methodologies used elsewhere to inform SDOT's understanding of potential impacts and benefits of various pricing programs. A key finding of this best practices scan indicates that when cities and regions have evaluated potential congestion pricing impacts and benefits, they have conducted and documented their evaluation using resource-intensive modeling of well-defined pricing programs. Other findings relevant to this phase of Seattle's evaluation are presented below.

---

[2] 2017 Center City Commuter Mode Split Survey Results

The Washington State Department of Transportation (WSDOT) will collect a toll on SR 99 through downtown Seattle when the tunnel opens (expected early 2019). WSDOT conducted a tolling study to determine toll rates and impacts of the newly-tolled facility, which is useful for this Congestion Pricing Study analysis. The WSDOT tolling analysis focused on achieving two goals: 1) minimize diversion and 2) meet the minimum revenue target. While income was considered in the diversion rate—assuming that lower-income drivers would be more price-sensitive and likely to change behaviors to avoid a toll—equity was not an explicit evaluation metric. A pricing program on downtown roads could mean that low-income drivers would be faced with no non-priced alternative routes.

Vancouver, BC conducted a high-level screening of pricing tools that reflected the goals and objectives that the region determined should be achieved by a mobility pricing program. The high-level screening approach discussed in the next section is based on Vancouver's example.

For additional lessons learned from mobility pricing efforts in other areas of the country and world, refer to the Pricing Tools, Equity and Pricing, and Messaging Best Practices White Papers.

PRICING TOOLS SCREENING APPROACH AND OUTCOME

Earlier in this study, the project team identified nine potential pricing strategies for Seattle to consider as part of a congestion pricing program. These were screened through a simple process designed to prioritize the most promising congestion pricing strategies for further study and refinement. The screening was informed by SDOT's preliminary goals and desired outcomes, the six key steps to pricing referenced in the companion Pricing and Equity White Paper, and implementation considerations.

Through the screening process, four pricing tools were recommended for further analysis. These tools are:

- Cordon pricing: Charge vehicles crossing the boundary into a designated zone
- Area pricing: Charge vehicles both crossing the boundary and driving inside a designated zone
- Fleet pricing: Apply targeted pricing to specific vehicle types, such as ride-hailing fleets or commercial vehicles; this can be applied within a designated zone or citywide
- Road user charge (RUC): Charge all vehicles for use of the roadway OR restrict access to a zone to vehicle enrolled in a RUC program

The Pricing Tools and Screening White Paper describes the screening process and rationale in greater detail.

HIGH-LEVEL IMPACTS AND BENEFITS ANALYSIS

This high-level impacts and benefits analysis uses readily available data to evaluate what impacts the four pricing options might have on different groups currently using the system. It also informs an understanding of the additional data needed to complete further analysis. The majority of the analysis focuses on area pricing. In the absence of well-defined pricing strategies (including specific geography, time, and fee schedule), area pricing serves as a proxy for both cordon pricing and a road user charge since both likely would include a charge for vehicles using a zone similar to the one assumed for Area Pricing in the following analyses.

Area Pricing: Impacts to Vehicle Trip-Makers

This section describes the findings from a preliminary evaluation of impacts of an area-based congestion pricing program on those making vehicle trips that would be affected by the pricing program. The analysis uses three publicly-available datasets and two similar pricing structure assumptions to estimate the impacts of such a program on people of color and low-income populations in Seattle, the Puget Sound region, and Washington state.

The primary findings of the analysis are:

- Auto trip-makers who are people of color may be—by some measures—disproportionately affected by a congestion pricing program.
- Higher-earning auto trip-makers are likely to be disproportionately affected by a congestion pricing program.
- Within the Puget Sound region and Seattle, white workers are likely to be disproportionately affected by a congestion pricing program.

The results of these analyses suggest that a zone-based congestion pricing program could have some inequitable impacts to people of color but—by and large—would cost wealthier, white drivers more than drivers who are low-income or people of color.

Methods

This equity analysis uses three primary sources of data:

- 2017 Puget Sound Regional Council (PSRC) Household Travel Survey
- 2016 Five-Year American Community Survey (ACS)
- 2015 Longitudinal Employer-Household Dynamics (LEHD) Origin-Destination Employment Statistics (LODES)

These datasets were used to produce two distinct analyses. The first analysis estimates the quantities and qualities of PM peak hour trip-makers that would be affected by a congestion pricing program, based on PSRC travel survey data for all trip types. The second analysis uses LODES and ACS data to estimate quantities and qualities of workers living or working in a potentially priced zone, which proxies as a measure of commute trips.

The potentially priced zone used in this analysis includes 25 distinct Census block groups[3], which are shown as a single polygon in Figure 7. This geography straddles I-5 and SR 99 and includes areas that could be considered outside the center city. These areas were intentionally included to increase sample sizes and produce conservative analyses that err on the side of over-estimating priced trips.

[3] Block groups were used because the lowest-level geography provided by PSRC travel survey data is the block group.

Figure 7 Potential Pricing Zone Used in this Analysis

[redacted]

[redacted]

[redacted]

Analysis Two: Worker Home and Job Locations Using LODES and ACS

The second analysis used 2015 LODES data (which consist of home-workplace pairs for jobs at the Census block level) to estimate commute travel affected by a congestion pricing program. These data include a far greater sample size (nearly all jobs[7]) than the PSRC travel survey data, but the analysis relies on the assumption that workers travel from their home to their workplace as a commute. Other assumptions inherent to a LODES-based analysis include:

- Workplaces in the data represent the physical location of the workers' employment activities (workers may, for example, have an office in Seattle but work in Bellevue)
- Current spatial patterns of employment are similar to those reported in 2015
- Workers live at their reported address (workers may, for example, have their permanent residence in Ellensburg but stay with family in Seattle during the work week)[8]
- Workers commute during times of the day that a pricing program would be active

To determine which workers would be affected by an area-based congestion pricing program, those with workplaces or residences located within the potential pricing zone were first flagged as potentially priced. ACS data was then used to find the percentage of commuters traveling to work in a car, truck, or van (variable B08006_002) in each Census tract. Each block was then assigned this percentage to produce a number of workers that would be affected by pricing.

Jobs in LODES data are included in one of three distinct monthly earning categories: less than $1,250, $1,250 to $3,333, and greater than $3,333. This categorization was used to estimate the difference in impacts on various worker income groups. ACS data for drive-alone commute rates by race/ethnicity in each census tract[9] (variable B08105A_002) were then applied to the priced trips from each block to determine the difference in impacts on various groups. All racial/ethnic groups other than "white alone" were considered people of color for this analysis.

[redacted]

[7] LODES data include all unemployment insurance-covered jobs and many federal government jobs. Job types that are not included are FBI, DEA, ATF, Secret Service, USPS, CIA, and others. For a more complete list of job types that are not included, see <https://lehd.ces.census.gov/doc/help/onthemap/FederalEmploymentInOnTheMap.pdf>

[8] This analysis does not include workers that live outside the state of Washington.

[9] ACS data were collected at the tract level and assumed to be spatially consistent across all internal blocks because ACS data at the block group level have far larger margins of errors.

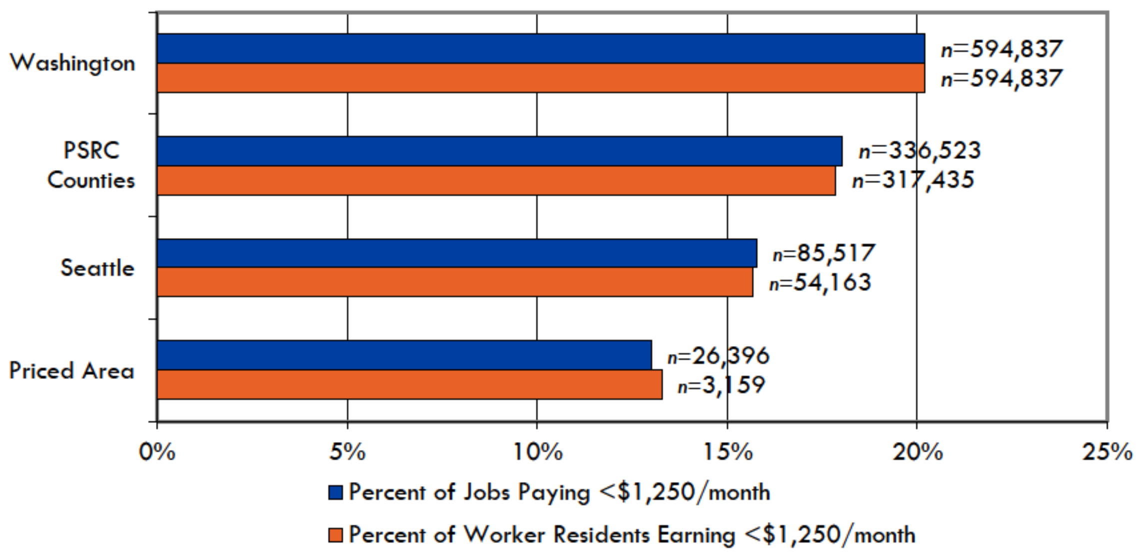
LODES data were also used to produce simple estimates of the types of jobs in the potential pricing zone relative to other geographies.

Results

This section presents the results of the analyses described above. As context, Figure 9 and Figure 10 show relevant percentages of lower- and higher-earning employment by geography. These percentages, which are based on LODES data, show that as the geography narrows to the center city potentially priced zone, the percentage of higher-earning jobs and worker-residents increases, while the percentage of lower-earning jobs and worker-residents decreases. This suggests that, at a very broad level, an area-based pricing program focused on center city would impact a greater number of higher-earning workers than lower-earning workers.

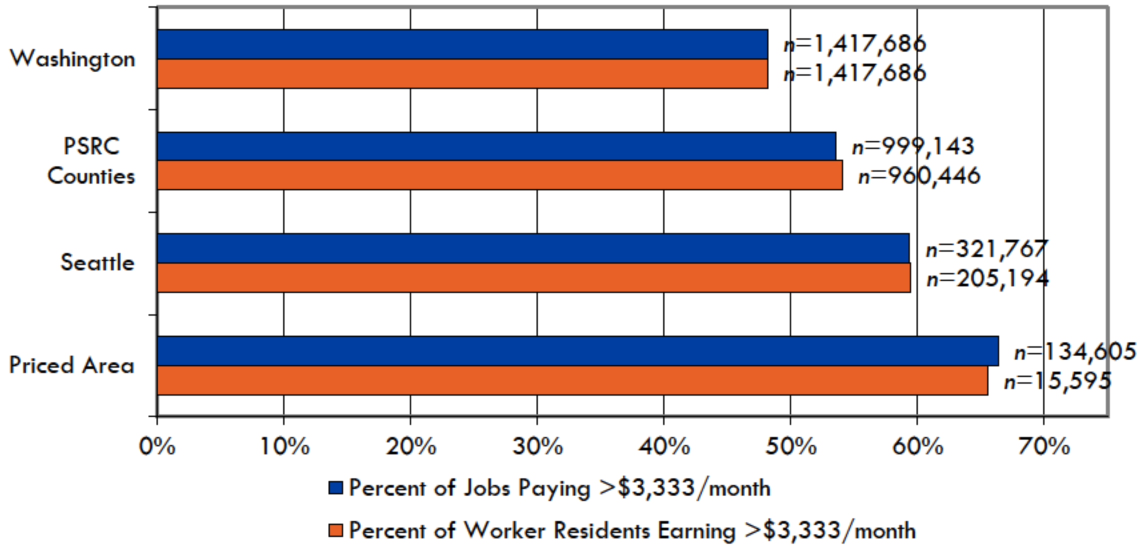
In both Figure 9 and Figure 10, the *n*= data labels indicate the number of jobs or worker-residents.

Figure 9 Lower-Earning Employment by Geography[10]



[10] PSRC counties are King, Kitsap, Pierce, and Snohomish counties.

Figure 10 Higher-Earning Employment by Geography



[redacted]

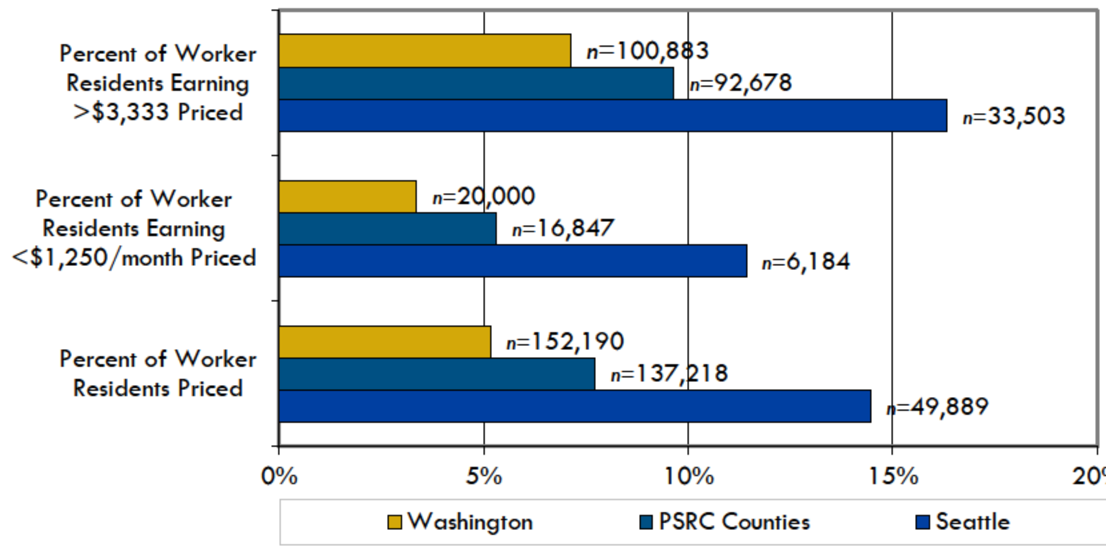
[11] PSRC. Draft Final Report: 2017 Puget Sound Regional Travel Study. P. 37. <https://www.psrc.org/sites/default/files/psrc2017-final-report.pdf>

[redacted]

Analysis Two: Worker Home and Job Locations Using LODES and ACS

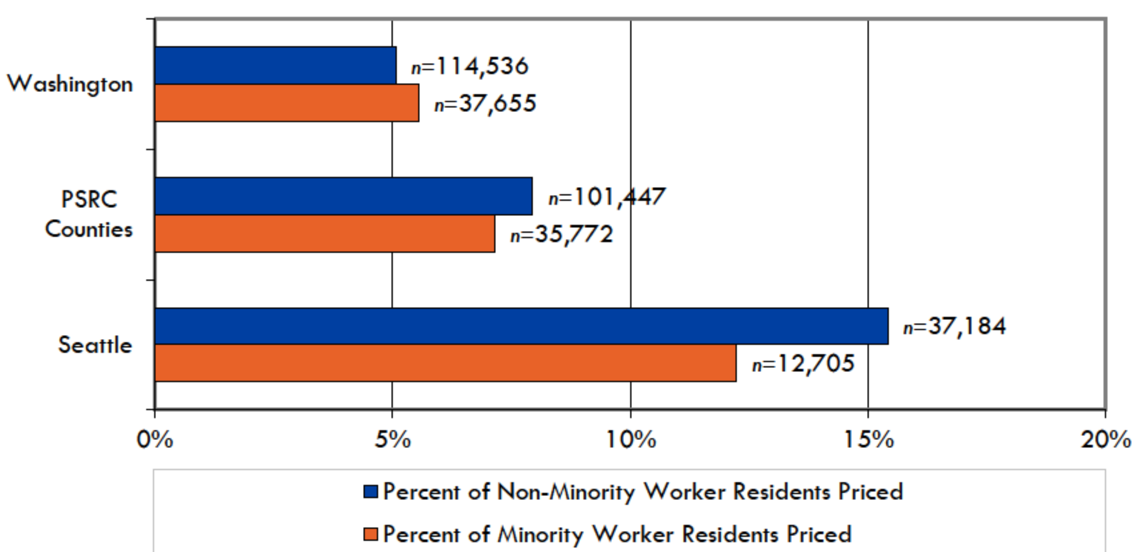
The results presented in Figure 13 show that, across all tested geographies, higher-earning worker residents are more likely to be impacted by a congestion pricing system than lower-earning worker residents.

Figure 13 Percentages of Priced Worker Resident Earning Types by Geography



The results presented in Figure 14 show that white workers living in Seattle and PSRC counties are more likely to be charged by a congestion pricing system than non-white worker residents. At the state level, racial minority (people of color) worker residents are more likely than white worker residents to be charged.

Figure 14 Percentages of Priced Worker Resident Race/Ethnicity Types by Geography



Area Pricing: Impacts to Transit Riders and Service

This section summarizes the results of a high-level analysis of the potential impacts and benefits of area pricing on transit riders and service. The primary findings of the analysis are:

- Both transit riders and operators could see significant benefits from an area pricing program in Seattle.

- Savings in transit travel time could fund additional transit service and accommodate some of the additional demand generated with implementation of a congestion pricing program.

Methods

This analysis estimated cumulative travel time savings for transit riders and transit operators in the presence of an area pricing program. To calculate the time savings for transit riders, the following equation was used:

Cumulative time saved (person minutes)	=	Transit vehicle trips	x	Travel time savings (minutes/trip)	x	Average vehicle load (people/vehicle)

The assumptions for each element of the equation are as follows:

- **Transit Vehicle Trips:** Transit vehicle trips include fixed-route bus service that travels through or within the potentially priced area (Figure 7). The analysis uses the number of trips operated by King County Metro (Metro), Sound Transit, and Community Transit in October 2018 during the weekday afternoon peak hour (4:30-5:30 PM). Three potential peak hours of service were evaluated; this hour was selected because it includes the greatest volume of transit trips starting or ending in the potentially priced area, compared to 4:00-5:00 PM and 5:00-6:00 PM.
- **Travel Time Savings:** Transit trips take an average of 37 minutes[12] to traverse the assumed pricing zone from north to south during the weekday PM peak hour. Based on travel time savings observed in cities with congestion pricing programs in place, an estimate of 15% travel time savings, or six minutes, was assumed for transit trips included in the analysis.
- **Average Vehicle Load:** To calculate average vehicle load, the project team used an assumed mix of current fleet types and capacities:

Vehicle type	50% of standing + seated capacity	Assumed proportion of fleet
40' standard coach	38.0	45%
60' articulated coach	56.5	45%
Double–decker coach	48.5	10%
Average vehicle load	48.0	

The average vehicle load is a composite of the fleet makeup and an assumption that vehicles are carrying half of their standing plus seated capacity while in the priced zone. The load value is based on the assumption that most vehicles start empty when they begin their trip in or near the edge of the potentially priced area. By the time they leave the area, most vehicles are at or near capacity during the PM peak hour. It is assumed that passenger boardings are distributed evenly through the priced zone and reach their maximum loads just prior to departing the zone. Thus, the average load during the trip

[12] Google Maps Navigation estimates 26-48 minutes (average: 37 minutes) for a transit vehicle to cross Seattle's Center City by transit, north to south, when departing on a weekday (Monday, 10/8/2018) during transit's PM peak hour (4:45 PM). This trip time reflects both a base time for a bus to cross the Center City, and additional time due to daily traffic delay.

through the zone is half of the average vehicle's (standing plus seated) capacity, or about 48 people.

Transit vehicle time savings is calculated using a similar equation, leaving out vehicle loads.

Cumulative time saved (vehicle minutes)	=	Transit vehicle trips	x	Travel time savings (minutes/trip)

Results

Using these equations and converting minutes to hours, the daily (weekday) travel time savings for transit riders and transit vehicles during the PM peak hour are shown in Figure 15. The daily person-hour savings are equivalent to about 1.25 full-time employees' hours for a year.

The transit vehicle hours saved could equate to a significant upgrade in service to one or more transit routes. For example (and depending on vehicle and operator availability), the potential savings is equivalent to 55 one-way trips that take one hour to complete. This could be five new PM peak trips on 11 routes, or enough capacity to carry more than 5,200 additional riders during the PM peak hour.

Figure 15 Estimated Weekday Hours of Transit Travel Time Saved with p.m. Peak Hour Area Pricing

Units	Daily hours saved
Person hours	2,592
Transit vehicle hours	55

Demographic and other characteristics of Metro riders, who represent the majority of riders in this analysis, are presented in

Figure 16. Overall, these riders are fairly representative of King County residents. Notable differences include age, region of residence, and vehicle ownership. A greater percentage of Metro riders are likely in the 55+ age category than the county population; however, the Metro rider survey only includes respondents 16 years of age or older, so the age group proportions cannot be directly compared.

Metro riders tend to be more concentrated in Seattle and North King County (64% of Metro riders compared with 34% of King County residents), with fewer living in East and South King County compared to the county population as a whole. Metro riders are also more likely to live in households without a vehicle than King County residents overall. Metro riders are fairly representative of the King County population in terms of race and household income.

Figure 16 King County Metro Rider[13] and King County Resident[14] Demographic Characteristics

Characteristic	Attribute	KCM Riders	King County
Gender	Male	48%	50%
	Female	52%	50%
Age	0-16	NA	21%
	16-17	3%	
	18-34	25%	26%
	35-54	34%	29%
	55+	38%	25%
Region of Residence	Seattle / North King County	64%	34%
	South King County	19%	38%
	East King County	17%	28%
Race/Ethnicity	White	69%	67%
	Black or African-American	5%	6%
	American Indian or Alaskan Native	1%	1%
	Asian or Pacific Islander	17%	17%
	Multi-race	1%	6%
	Hispanic	5%	9%
	Other	0%	NA
Vehicle/Driver Information	Valid driver license	84%	NA
	Household owns a vehicle	76%	90%
	Vehicle for personal use	93%	NA
Annual Household Income	<$35,000	25%	22%
	$35,000 - $100,000	34%	39%
	>$100,000	32%	39%
Disability	Yes	14%	10%
	No	86%	90%

Because certain demographic groups are overrepresented among Metro's ridership, travel time transit time savings will likely be disproportionately allocated to these groups. Because the sources of data for Metro's ridership and King County's population are samples, it cannot be said with a high degree of confidence that difference of a few percentages between populations represents a real-world difference. For gaps that are more than a few percentage points, it can be

[13] King County Metro 2016 Rider Survey Report

[14] U.S. Census Bureau, 2016 American Community Survey Five-Year Estimates

said with more confidence that these groups will receive disproportionate benefits from transit travel time savings.

It is likely that, among King County residents, older people will disproportionately benefit from transit travel time savings, along with those living in Seattle and North King County. King County residents who do not own a car will also likely disproportionately benefit from transit travel time savings. Residents with a disability will likely disproportionately benefit.

Demographic groups living in King County that will disproportionately not receive benefit are likely to be Hispanic/Latino people, people identifying as multi-racial, and high-earning households.

Comparing Transit and Auto Travel Time

To assess existing transit service to Seattle's Center City area, a comparison of transit- and auto-based travel was conducted for each census block group in all four PSRC counties. This analysis was conducted using the Google Directions API, which was called to return a travel time between the centroid[15] of each block group and five destinations in the center city area. These five destinations were selected to balance geographic distribution of destinations with major activity centers:

- Occidental Square
- Columbia Tower
- Washington State Convention Center
- Space Needle
- Westlake Avenue N at Harrison Street

Both transit and auto mode API calls were given parameters instructing their trips to arrive as close to 8:45 a.m. as possible on a Wednesday. The five travel times (one for each destination) by auto and transit to each of the Center City destinations were then averaged to produce a mean transit travel time and mean auto travel time to Center City Seattle from each census block group. These mean transit and auto travel times were then used to produce total travel time difference in minutes and percent difference in travel time per census block group.

The significant shortcoming of this analysis is the lack of trips that are chained using non-walking and transit modes. Although the Google Directions API does incorporate walking into transit trips (after a certain number of minutes/miles of walking to get transit, Google Directions API stops considering a trip possible via transit, however), it does not allow for theoretical trip-takers to drive or walk—say, to a park-and-ride—to transit. This means that park-and-ride drivesheds, amongst other multimodal trips, are not included in the transit trips modeled for this analysis. For all block groups where transit trips were not possible, no travel time comparison was calculated.

Figure 17 shows the absolute difference in travel time (in minutes) for a.m. peak hour trips to the center city made via transit and auto. Figure 18 shows the same difference, symbolized as a percent.

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[15] The US Census Bureau's standard INTPTLAT and INTPTLON fields were used in lieu of centroids; they are similar and are generally located outside of GIS water polygons.

Figure 17 Transit Time vs. Driving Time to Center City During AM. Peak Hour - Total Difference

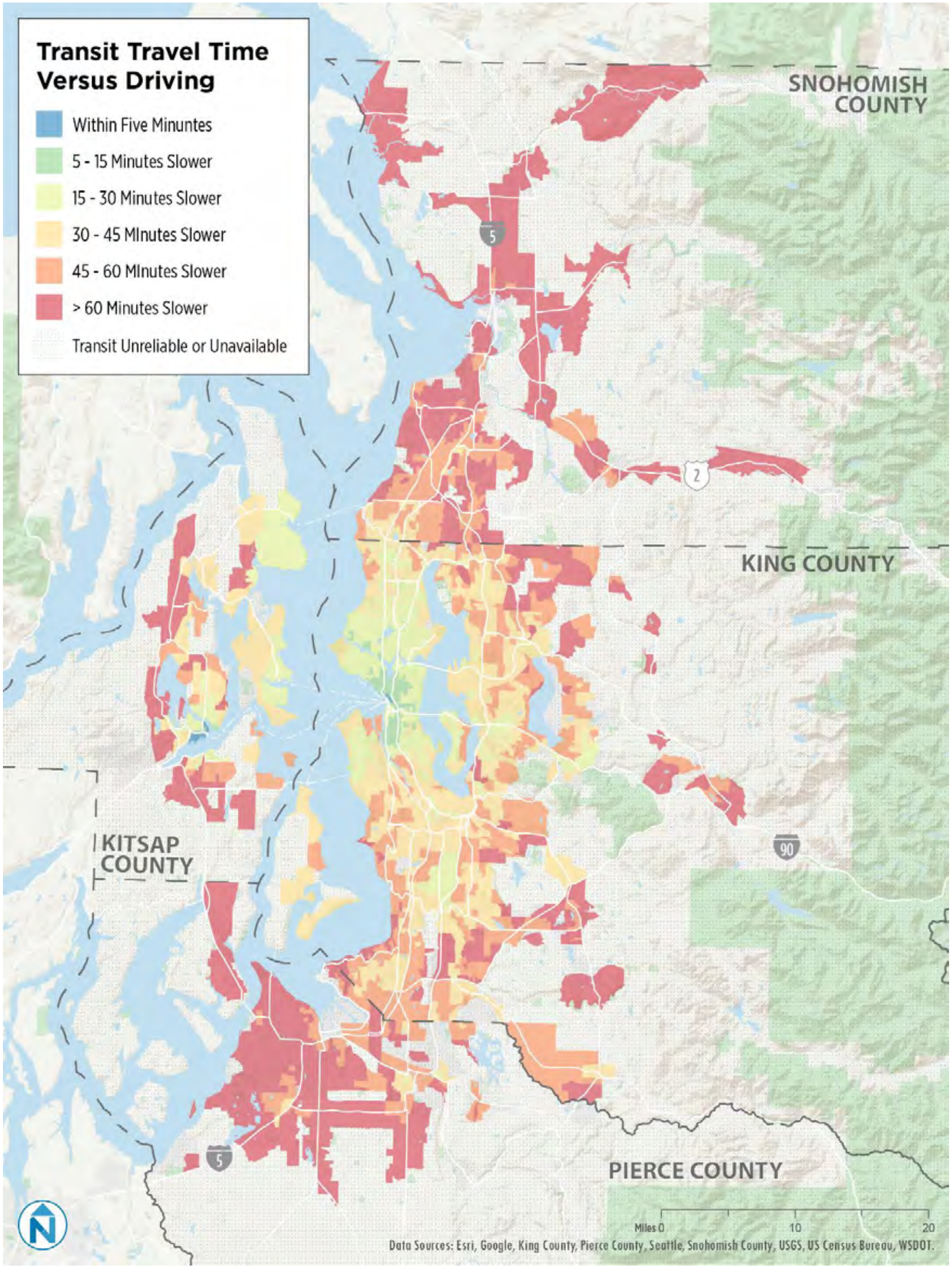
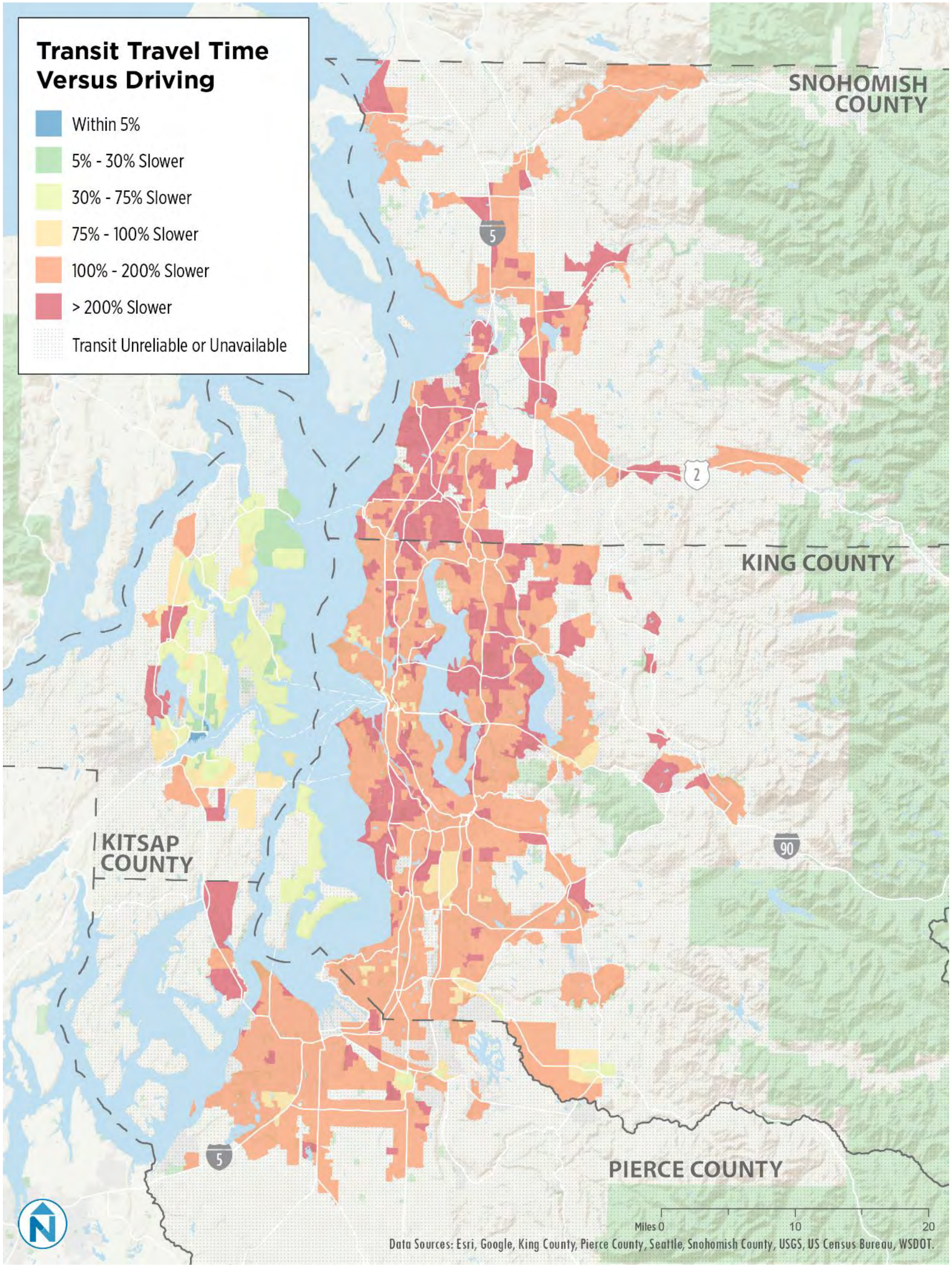


Figure 18 Transit Time vs. Driving Time to Center City During AM Peak Hour - Percent Difference



In both representations of travel time difference, the only areas that where transit is truly time-competitive with driving to the Center City are the Center City itself and Bremerton, which is

served by both the Kitsap Fast Ferry and the Washington State Ferry. Areas where transit travel is nearly time-competitive with auto travel are eastern portions of the Kitsap Peninsula, the City of Seattle, Issaquah Highlands, Kent, Puyallup, Sumner, and Lakewood. Elsewhere, driving to Center City Seattle in the a.m. peak is considerably faster than transit.

Fleet Pricing

The impacts and benefits of a congestion-reducing fleet pricing program would be highly dependent on the times, locations, and levels of pricing. The largely proprietary nature of data on fleet vehicle behavior makes it difficult to tailor these parameters to potential pricing program goals. This portion of the white paper explains data needs, discusses potential parameter definitions, and outlines a theoretical understanding of likely impacts and benefits.

To produce a thorough impacts and benefits analysis of a fleet pricing program—which would follow sequentially—the following variables must be addressed:

- Data availability for fleet vehicles in Seattle
- Definition of fleet vehicles for congestion pricing purposes
- Identification of applicable pricing tactics
- Assessing pricing-relevant technologies of fleet vehicles
- Planning data collection for iterative implementation

Baseline Fleet Data

The foundation for successful fleet pricing is data that provide an accurate understanding of baseline fleet conditions. At a minimum, it is imperative to have a rough understanding of how many vehicles of each type are operating within a potential pricing zone. At present, SDOT has access to at least two datasets that can be used to assess baseline fleet conditions: Teralytics mobile phone data and aggregated TNC origin-destination data. These data are not yet available to the project team, limiting the fleet pricing analysis.

[Section will be updated with baseline data when available. Project team members are working with SDOT staff on a data agreement]

Defining Fleet Vehicles

Perhaps the most essential parameter a fleet pricing program must define is what constitutes a “fleet vehicle.” Potential categories/definitions of fleet vehicle are:

- Ride-hailing vehicles (e-hailing and/or street-hailing type)
- First-mile/last-mile delivery vehicles (trucks, vans, and/or personal vehicles)
- Tour vans and buses
- Heavy trucks (and/or other high-emissions vehicles)
- Vehicles operated by entities with more than *x number* of registered vehicles
- Vehicles owned by a incorporated entity, as opposed to an individual

Beyond these definitions, vehicles can be targeted according to their relative emissions, size, or congestion production. Without a rough understanding of current vehicle type shares and volumes in Seattle, it is difficult to align congestion pricing goals with proposed fleet pricing parameter definitions.

However, there has been robust enough evaluation of existing congestion pricing programs to support a discussion of the generalized theoretical understanding of fleet pricing impacts:

- **Ride-hailing vehicles** (and particularly e-hailing vehicles) have been widely implicated as a major contributor to increased congestion in a number of U.S. cities.[16,17,18,19,20] Pricing e-hailing vehicles, which typically operate as a *de facto* fleet, could reduce their overall vehicle miles traveled (VMT).

  An analysis conducted on taxi use in New York City found that for-hire passengers are less sensitive to price increases than other road users, suggesting that only a significant charge would be effective in reducing ride-hail VMT. One examination of pricing ride-hailing vehicles in New York City concluded that a per-hour charge would be most effective,[21] while the New York City Council recently capped the number of e-hailing vehicles allowed to operate in the city.[22]

  Pricing e-hailing vehicles may be a sound tactic, as Uber has publicly supported a congestion pricing program in Seattle.[23] Uber CEO Dara Khosrowshahi recently wrote: "One policy we plan to put our energy behind is congestion pricing, which is viewed by urban planners, transit advocates, and academics as the single best way to ease the road congestion that is choking many cities across the globe. We're ready to do our part to help cities that want to put in place smart policies to tackle congestion—even if that means paying money out of our own pocket to pass a tax on our core business."[24]

- **First-mile/last-mile delivery vehicles**, such as those used by Amazon, FedEx and UPS, wholesale distributors, and other goods deliverers, likely cause congestion disproportionate to their VMT because of typical delivery behaviors (including reversing to loading docks, double-parking, cruising for load zones, and slow travel). In New York City, it was recommended that these vehicles be priced at 2.2 times the rate of personal vehicles due to their outsized impact on congestion.[25]

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[16] San Francisco County Transportation Authority. October 2018. "TNCs & Congestion". <https://www.sfcta.org/sites/default/files/content/Planning/TNCs/TNCs_Congestion_Report_181015_Final.pdf>

[17] Schaller Consulting. July 25, 2018. "The New Automobility: Lyft, Uber and the Future of American Cities". <http://www.schallerconsult.com/rideservices/automobility.pdf>

[18] Metropolitan Area Planning Council. February 2018. "Fare Choices: A Survey of Ride-Hailing Passengers in Metro Boston". <http://www.mapc.org/wp-content/uploads/2018/02/Fare-Choices-MAPC.pdf>

[19] Gutman, David. November 5, 2018. *Seattle Times*. "How popular are Uber and Lyft in Seattle? Ridership numbers kept secret until recently give us a clue". <https://www.seattletimes.com/seattle-news/transportation/how-popular-are-uber-and-lyft-in-seattle-ridership-numbers-kept-secret-until-recently-give-us-a-clue/>

[20] UC Davis Institute of Transportation Studies. October 2018. "Disruptive Transportation: The Adoption, Utilization, and Impacts of Ride-Hailing in the United States". <https://itspubs.ucdavis.edu/wp-content/themes/ucdavis/pubs/download_pdf.php?id=2752>

[21] Schaller Consulting. July 25, 2018. "The New Automobility: Lyft, Uber and the Future of American Cities". <http://www.schallerconsult.com/rideservices/automobility.pdf> p. 9.

[22] Local Law No. 147 (2018) of City of New York. Int 0144-2018. <https://legistar.council.nyc.gov/View.ashx?M=F&ID=6467078&GUID=F5AFBAEE-1A39-4540-B4F1-D386701C52B9>

[23] Beekman, Daniel. October 8, 2018. *Seattle Times*. "Uber gets political, will spend $10M pushing for 'congestion pricing' tolls in Seattle, elsewhere". <https://www.seattletimes.com/seattle-news/politics/ride-hail-companies-to-lobby-for-congestion-pricing-in-seattle-as-city-considers-tolling-downtown-streets/>

[24] Khosrowshahi, Data. September 26, 2018. "The Campaign for Sustainable Mobility". <https://www.uber.com/newsroom/campaign-sustainable-mobility/>. Emphasis by Nelson\Nygaard.

[25] Fix NYC Advisory Panel. January~~u~~ 2018. "Fix NYC Advisory Panel Report". <http://www.hntb.com/HNTB/media/HNTBMediaLibrary/Home/Fix-NYC-Panel-Report.pdf>. p. 21.

Delivery vehicles, which can be personal autos, vans, or light or heavy trucks, are an important component of a high-functioning urban economy and would need to be priced in a way that avoids disproportionate charges to certain industries. An analysis of Stockholm business revenues before and after congestion pricing implementation found that the pricing program had no negative impacts; on the contrary, center city retail and wholesale sectors showed positive changes in revenue versus the county at large.[26] Because delivery vehicles infrequently make discretionary trips, their elasticity rates are likely lower than personal autos, meaning that some portion of priced trips will likely pass a congestion charge on to consumers.

- Tour vehicles, such as terrestrial and amphibious tour buses, operate throughout Seattle, with higher trip volumes during summer and the peak tourist season. These vehicles are largely diesel-powered, which makes them significant contributors to air and noise pollution. A fleet charge on tour vehicles would likely be passed on to consumers, which could reduce ticket sales and revenues for the tour companies.
- Pricing heavy trucks (or other high-emissions vehicles) would charge vehicles producing the greatest relative rates of harmful emissions and damage to roadways. These vehicles typically also cause more congestion than personal autos when driven in urban environments because of their slow movement, delivery behaviors (e.g., backing up to loading docks, double-parking), and poor maneuverability.

  Semi-trailers are not typically operated in the center city of Seattle because of its land use and street network, so pricing these vehicles may only affect a small proportion of total VMT. Rather, it may be prudent to consider a ban on trucks over a certain size in the center city (except with a special permit) as a component of a fleet pricing initiative. As with pricing first-mile/last-mile delivery vehicles, any fleet charge would likely be passed on to consumers. Most semi-trailer container trips to and from the Port of Seattle would likely not be priced, as they do not typically pass through Seattle's center city.
- "Fleet vehicles" could also be defined by counting the number of vehicles operated by an individual entity, regardless of type or purpose. This could take the form of a fleet charge for a vehicle that is owned by an entity that operates *x number* of other vehicles, or for any vehicle owned by an incorporated entity and not a person. In London, a vehicle receives a £1 discount on the congestion zone charge if it is part of a fleet, which is defined as six or more vehicles.[27] Rigorous enforcement for both of these classification approaches would be both necessary and challenging.

Fleet pricing should be informed by the general understanding that—to the extent fleet vehicles provide goods and services—any charge will likely be passed on to consumers. Additionally, goods movement trips are rarely discretionary; evidence from Sweden's congestion pricing program showed that only 5% of "professional traffic" was eliminated by implementing a congestion charge, suggesting a low level of price sensitivity.[28]

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[26] City of Stockholm Traffic Administration. September 21, 2009. "Analysis of traffic in Stockholm". <http://www.stockholm.se/PageFiles/70349/Sammanfattning%20eng%20090918_.pdf>

[27] The threshold was lowered from ten to six vehicles: <http://www.politics.co.uk/reference/congestion-charge>

[28] Eliasson, Jonas. July 2014. "The Stockholm congestion charges: an overview". <http://www.transportportal.se/swopec/cts2014-7.pdf>. p. 14.

Define Pricing Parameters

A successful fleet pricing program depends on well-defined pricing parameters. To best achieve potential congestion pricing goals, SDOT will need more robust datasets with which to set fleet pricing zones, times, charge amounts, and vehicle classifications. Ideal data would give analysts a clearer picture of when, where, and what types of vehicles are used in Seattle.

Considerations when defining fleet pricing parameters rest largely on estimated elasticity rates of various fleet vehicle and trip types. Although these rates are unique to a metro area, there are some precedent estimations available. Swedish researchers have used 10 years of congestion pricing experience to estimate elasticities for private vehicles, trucks, and all vehicles, in both peak and off-peak travel periods.[29] Elasticity estimates could be produced from other congestion pricing data abroad and from U.S. tolling data. These sources likely would need to be combined to inform parameter definition for fleet pricing in Seattle.

Definitions of fleet pricing parameters should be closely tied to theoretical understandings of likely outcomes. For example, consider the following potential outcomes:

- Pricing peak hour and daytime first-mile/last-mile delivery trips could incentivize delivery services to operate at night.
- Imposing hefty charges on larger delivery vehicles may shift fleet owners to smaller vehicle types or to non-auto delivery modes, such as UPS' current e-trike small pod delivery pilot in downtown Seattle.[30]
- Pricing all incorporated entity vehicles may reduce traffic caused by people with access to "company cars," shifting their trips to public transport.
- Pricing e-hailing fleet vehicles could make public transit and active transportation more attractive travel options.

In general, fleet pricing should reduce discretionary professional VMT.

Fleet Pricing Technologies

Pricing fleet vehicles could be simpler logistically than pricing personal use vehicles, as market penetration of vehicle tracking and communication technology is more consistent in fleet vehicles. E-hailing vehicles, for example, are tracked across both space and time by their parent companies, making potential price assessment and billing processes simple. Other data collected by e-hailing companies include deadhead time, passenger count, and vehicle type—all of which could be incorporated into a fleet pricing program.

Recently-implemented federal electronic logging device rules have accelerated the trucking industry's transition toward advanced onboard technology. Operators of large fleets are adopting GPS tracking of vehicles, and truck manufacturers have begun incorporating GPS into new vehicles, representing an opportunity to introduce and streamline fleet pricing for these vehicle types.

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[29] Centre for Transport Studies Stockholm. February 2017. "The Swedish Congestion Charges: Ten Years On". <http://www.transportportal.se/swopec/cts2017-2.pdf>

[30] UPS. October 25, 2018. "UPS To Launch First-Of-Its-Kind U.S. Urban Delivery Solution In Seattle." <https://www.pressroom.ups.com/pressroom/ContentDetailsViewer.page?ConceptType=PressReleases&id=1540482965617-103>

Fleet Pricing as a Data Collection Opportunity

Fleet pricing is an opportunity to fill aforementioned data gaps and to use these new data to operate an iterative fleet pricing program. A timetable could be set, for example, to analyze historic charging data, re-evaluate a fleet pricing program's progress towards stated goals, and adjust pricing parameters accordingly. These changes could be made on a fully-dynamic, minute-by-minute schedule, or at a fixed interval (e.g., every month or every quarter).

Because a successful fleet pricing program depends on accurate data, it is important to plan, from the outset, what data must be collected and how it will be iteratively incorporated into program optimization.

BEHAVIOR CHANGE AND PRICE SENSITIVITY

Behavior Change

Changes in travel behavior have been documented following the implementation of congestion pricing in cities such as London, Stockholm, and Singapore. These changes include decreased volumes of private vehicles in charged areas, increased public transit activity, and redistributions of traffic flows.[31,32] Additional behavior changes that are often made but are more difficult to document include the following:[33]

- Some trips may not be made at all
- Some trips may be made using an alternate travel mode
- Some trips may be deviated to alternate routes or destinations
- Some trips may be shifted to different times of day

Research into how congestion pricing can prompt behavior change shows trends in the relationship between price and travel behavior change:[34]

- Higher value trips (i.e., commute trips and business travel) tend to be less price sensitive than lower value trips (i.e., shopping and recreation trips)
- People with higher incomes tend to be less sensitive to pricing than people with lower incomes
- If better travel options are available, trips tend to be more price sensitive
- The impacts of fees can be affected by how they are promoted, structured, and collected
- People who drive are more likely to accept vehicle price increases if they are presented as part of a larger program that is considered fair and provides dispersed benefits

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[31] International Council on Clean Transportation. April 2010. "Congestion Charging: Challenges and Opportunities". https://www.theicct.org/sites/default/files/publications/congestion_apr10.pdf

[32] World Resources Institute. January 2017. "Study on International Practices for Low Emission Zone and Congestion Charging," https://www.wri.org/sites/default/files/Study_on_International_Practices_for_Low_Emission_Zone_and_Congestion_Charging.pdf

[33] Transport for London. September 2008. "Demand Elasticities for Car Trips to Central London as revealed by the Central London Congestion Charge". http://content.tfl.gov.uk/demand-elasticities-for-car-trips-to-central-london.pdf

[34] Victoria Transport Policy Institute. February 27, 2017. "Understanding Transport Demands and Elasticities: How Prices and Other Factors Affect Travel Behavior". http://www.vtpi.org/elasticities.pdf. pp. 41-43.

- The perception of fairness is a key factor in how people respond to pricing and their preferences for different price structures
- The perception of too much complexity in a cost structure can motivate people to "disengage" from a priced mode
- Travel behavior can be influenced by the method and timing of road pricing payments

Price Elasticity

A traveler's sensitivity to changes in price is called price elasticity. It is the foundation of models to estimate travel behavior changes in a congestion pricing scenario. This number can be estimated from observed elasticities on similar priced roads (such as the SR 520 bridge) or from experiments in other cities. A well-estimated elasticity makes it possible to forecast how travel behavior may change based on a proposed congestion pricing program.

Estimating Elasticities

A travel-price elasticity is generally a single number that represents the percentage change in consumption of travel (which can be defined as trip-taking, miles driven, mode used, etc.) that results from a 1% change in price. Elasticities of some sort have been estimated for most major road tolling studies, transit fare analyses, and other urban planning pricing studies. Because there are so many variables that interact with a traveler's trip-making decisions, elasticities are best estimated based on observed responses to price changes.

Figure 19 shows a sample of vehicle travel elasticities based on peak/off-peak road pricing and traveler income. Figure 20 provides equations for calculating price elasticity of a priced travel mode or path.[35]

Figure 19 Consumer Demand Elasticities (2000)

	Price, Peak	Price, Off-Peak	Income
Vehicle travel - essential trips	-0.16	-0.43	0.70
Vehicle travel - optional trips	-0.43	-0.36	1.53
Bus, Tram, Metro passenger-kms	-0.19	-0.29	0.59
Rail passenger-kms	-0.37	-0.43	0.84

Note: Table reflects data collected in studies of travel in European cities.

Source: VTPI, 2017

[35] Victoria Transport Policy Institute. February 27, 2017. "Understanding Transport Demands and Elasticities: How Prices and Other Factors Affect Travel Behavior". http://www.vtpi.org/elasticities.pdf

Figure 20 Equations for Road Pricing Elasticity

Elasticity Equations

Arc Elasticity

$$\eta = \frac{\Delta \log Q}{\Delta \log P} \quad \text{or} \quad \eta = \frac{\log Q_2 - \log Q_1}{\log P_2 - \log P_1}$$

$$P_2 = P_1 \left(\frac{Q_2}{Q_1}\right)^{\frac{1}{\eta}} \quad \text{or} \quad Q_2 = Q_1 \left(\frac{P_2}{P_1}\right)^{\eta}$$

Mid-Point Arc Elasticity

$$\eta = \left[\frac{\Delta Q}{\frac{1}{2}(Q_1+Q_2)}\right] \div \left[\frac{\Delta P}{\frac{1}{2}(P_1+P_2)}\right] \quad \text{or} \quad \eta = \left[\frac{\Delta Q}{P_1+P_2}\right] \div \left[\frac{\Delta P}{Q_1+Q_2}\right] \quad \text{or} \quad \eta = \frac{(Q_2-Q_1)(P_1+P_2)}{(P_2-P_1)(Q_1+Q_2)}$$

$$P_2 = P_1 \times \left[\frac{Q_1(\eta-1)+Q_2(\eta+1)}{Q_2(\eta-1)+Q_1(\eta+1)}\right] \quad \text{or} \quad Q_2 = Q_1 \times \left[\frac{P_1(\eta-1)-P_2(\eta+1)}{P_2(\eta-1)-P_1(\eta+1)}\right]$$

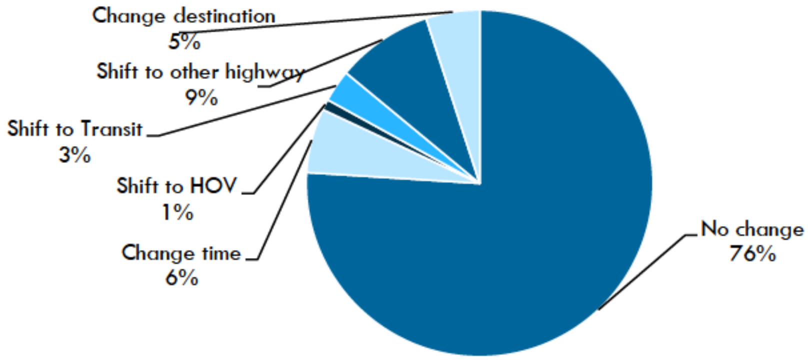
where η is the elasticity value, Q_1 and Q_2 are before and after consumption, and P_1 and P_2 are before and after price or service.

Source: VTPI, 2017

Because congestion pricing has not been implemented in any U.S. cities, elasticity estimates used to model mode shift, reductions in travel, or trip re-routing in a Seattle congestion pricing scenario will need to be carefully selected. A sampling of relevant elasticities includes:

- Puget Sound Traffic Choices Study: PSRC conducted a study of 275 households to develop elasticities for potential tolling systems in the Puget Sound region. This analysis is highly relevant to a Seattle congestion pricing effort. Its shortcomings include the dates in which it was conducted (early 2000s) and its geography (the Seattle metro area).
- London Congestion Charge: Elasticities based on observed traveler responses to the introduction and subsequent changes to London's central zone congestion charge are a helpful reference for Seattle. London's urbanized world market-based economy, similar demographic-employment dynamics, and travel landscape are a better reference point for congestion pricing in Seattle than—for example—Singapore, where the sociopolitical context differs more significantly.
- New York Bridges & Tunnel Tolls: Elasticities developed from observed travel changes in New York City are relevant because Seattle's geography is similar to New York's; auto access to both cities is limited by water.
- SR 520 Bridge Tolls: Analysis of the relationship between SR 520 bridge tolls and travel behavior would be valuable in informing congestion pricing elasticities in Seattle. Although much of this work has been conducted with PSRC's travel model to help set the current variables toll rates, defined elasticity rates have not been shared publicly. Since the introduction of SR 520 bridge variable tolling and accompanying improved transit service, it has been estimated that 76% of bridge users made no change in their travel and 11% of users made the same trip but at a different time or using a different mode (Figure 21).

Figure 21 SR 520 Tolling Effects on Demand[36]



More difficult to measure are elasticities that estimate the relationship between road price increases and travelers shifting away from auto travel modes. Because there are so many variables that interact with a traveler's trip-making decisions, a simple price-traffic volumes elasticity is likely a more reliable predictor of congestion pricing impacts than a price-mode share elasticity, which would attempt to tease out the relationship between pricing, geography, travel options, time-of-day travel distribution, and demographics.

That being said, surveys and other tools (such as PSRC's travel models) can be used in conjunction with traffic volume elasticities to estimate the amount of trips that might shift to transit in a congestion pricing scenario. It is likely this shift would occur if road pricing were introduced to the Puget Sound region, given the availability of high-capacity transit, geographical constraints for accessing Seattle's center city, and high downtown core parking prices. An analysis of this type was performed as a part of the Puget Sound Traffic Choices Study, finding that the elasticity of home-to-work travel was approximately four times greater for residents with access to high-quality transit.[37]

Applying Elasticities

After identifying and vetting relevant elasticities for a Seattle congestion pricing approach, a high-level travel model will need to be developed to implement them, producing estimated reductions in traffic, VMT, time-of-day travel, or mode shifts (depending on the type of elasticity application).

Estimates of travel reductions cannot be performed, however, without details on the types of facilities, vehicles, trips, times, and/or people to be priced. These inputs, along with information identified elsewhere in this report (e.g., sources of trips traveling to the priced area, the distance and time of those trips, and the demographics of the trip-takers) will also be integral to this high-level model.

Through a separate effort, SDOT has research underway to develop an understanding of the price elasticities associated with on-street parking. When that research is complete in late December 2018, the project team will review the findings for inclusion in this white paper.

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[36] WSDOT, 2012. Managing Congestion with Tolls on the SR 520 Floating Bridge. <https://www.ibtta.org/sites/default/files/Stone_Craig.pdf>. p. 12

[37] p. 88

Demand for Additional Transit Service

[Research on the following questions is underway:

- What does the research say about the impacts of improved frequency and reliability on ridership?
- How can we use this to estimate the number of new transit riders, and thus the amount of service needed to accommodate increases in ridership?]

Household Income Impacts

[When the research above is complete, additional analysis will be undertaken to answer the following questions:

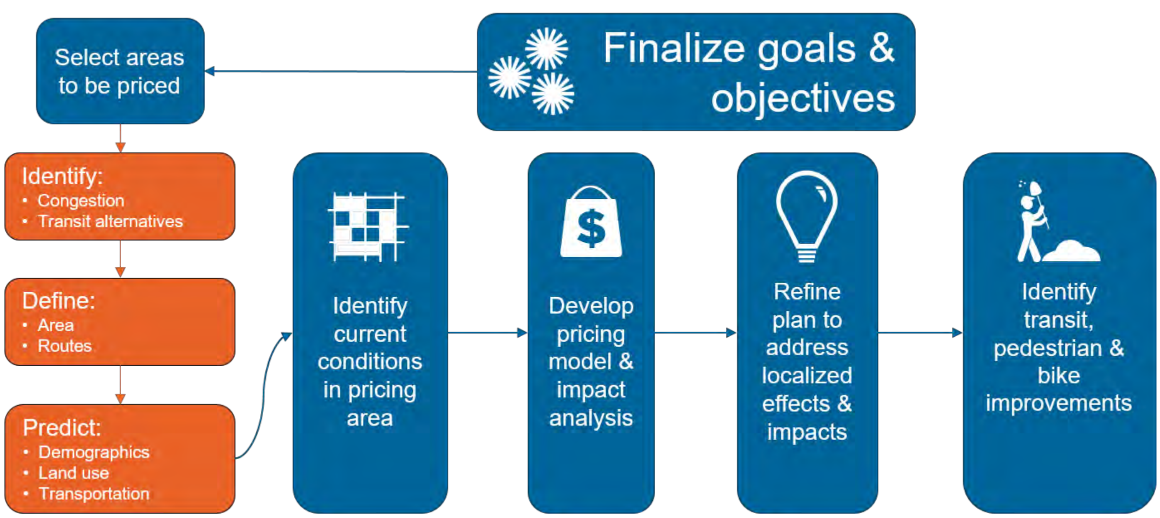
- Using the results of research in prior two sections, who is still driving?
- What is the demographic profile of those still driving?
- What is the relative scale of household income impacts for those still driving?]

PHASE 2: DETAILED CONGESTION PRICING EVALUATION

This impacts and benefits analysis provides a high-level summary of how various congestion pricing strategies might distribute impacts and benefits to different groups of people who use Seattle's roadways.

To understand the full impacts of congestion pricing strategies on various communities—and to develop a potential congestion pricing program in a way that meets City of Seattle goals—a more thorough analysis and evaluation is needed, supported by extensive community engagement. Figure 22 describes a potential process for moving forward with additional analysis in Phase 2 of the SDOT Congestion Pricing Study.

Figure 22 Proposed Analysis Approach for Phase 2 of Congestion Pricing Study



The first step in this proposed approach is to confirm and finalize the goals and objectives of congestion pricing in Seattle. This would be informed by deep and wide community and

stakeholder involvement that would begin in 2019 and continue throughout the analysis and program development processes.

The next steps involve clearly defining pricing programs to be evaluated, documenting existing conditions, and assessing candidate technologies for administering the pricing program(s). The existing conditions would then be modeled to support comparison with a modeled pricing program. This would likely be an iterative process of refining and re-analyzing the impacts of various congestion pricing scenarios. Ultimately, the analysis would support the recommendation for a preferred program, supported by investments in related transportation infrastructure and service improvements.

DRAFT CONGESTION PRICING TOOLS SCREENING MEMO

INTRODUCTION

In response to ever-increasing traffic and with the realization that metropolitan regions cannot build themselves out of congestion, various congestion pricing solutions have been piloted and adopted globally. Congestion pricing uses the economic principal of supply and demand to manage traffic. By imposing an additional cost to using a certain mode of transportation, travelers are given a pricing signal to alter their transportation choice. As the congested mode of transportation becomes more expensive, alternative transportation modes become more attractive.

The following draft goals begin to articulate why the Seattle Department of Transportation (SDOT) is studying congestion pricing. These preliminary goals are based on ideas generated from several workshops with SDOT staff to 1) explore how equity can be applied to a pricing program and throughout the planning and implementation; 2) identify potential impacts and benefits of a pricing program; and 3) understand the universe of pricing tools and mechanisms available and in use in other cities.

Draft Congestion Pricing Goals	
1	**Create a more equitable transportation system**
Reinvest in affordability and housing	
Increase and improve transportation options for low-income populations	
Democratize decision-making power regarding mobility options	
2	**Improve climate and health**
Change travel behavior to support more active and sustainable modes	
Decrease peak period congestion and particulate matter	
Encourage more fuel-efficient or fossil-fuel-free travel	
3	**Decrease traffic congestion**
Make travel to/through Seattle more predictable and reliable for people and goods	

POTENTIAL PRICING TOOLS

There are many potential pricing tools available, and some tools may achieve certain goals better than others. Ultimately, the City may need a combination of tools to achieve its goals, as there is no one tool that can do everything. The following table introduces the tools screened for Seattle.

Pricing Tools Summary

Pricing Tool	Description
Cordon Pricing	Charge vehicles crossing the boundary into a cordon pricing zone

Pricing Tool	Description
Area Pricing	Charge vehicles crossing the boundary and driving inside an area pricing zone
Fleet/Vehicle Class Pricing	Apply targeted pricing to specific vehicle types entering a zone, such as ride-hailing fleets or commercial vehicles
On-Street Parking Pricing	Vary street parking prices to control demand
Off-Street Parking Pricing	Apply a variable fee/tax to off-street parking facilities
Road User Charge (RUC)	Restrict access to a zone to vehicles enrolled in a RUC program that replaces fuel tax with payment per mile traveled, by time of day, and/or location traveled
Arterial Toll Roads	Price entire arterial roads
Arterial Express Lanes	Convert or add some lanes on arterial roads as tolled lanes, such as converting bus-only lanes or an existing general-purpose lane
Connected/Autonomous Vehicle (C/AV) Zone	Create a zone that allows only licensed connected/autonomous vehicles

SCREENING THE TOOLS

These nine tools were screened using a process designed to prioritize the most promising congestion pricing approaches for further study and refinement. The assessment was informed by the preliminary goals and desired outcomes, as well as the six key steps to pricing TransForm is developing as part of its congestion pricing and equity toolkit, which will be released by December 2018. It is similar to the process Vancouver is employing, described in Appendix A.

Six Key Steps in Pricing	
1.	Identify Who, What, and Where
2.	Define Equity Outcomes and Performance Indicators
3.	Determine Benefits and Burdens
4.	Choose Programs that Advance Transportation Equity
5.	Provide Accountable Feedback and Evaluation
6.	Anticipate and Plan for Future Opportunities

With these key steps, preliminary goals, and desired outcomes, the screening process applied the following scoring metrics and scale to qualitatively assess each potential pricing tool:

Metrics

Metric	Definition
Equity	Higher scores are given to tools that would equitably distribute costs across target populations; support reinvestment in housing and affordability through the creation of new revenue sources; support more and better transportation options for low-income people; and democratize decision-making power regarding mobility options.
Climate and Health	Higher scores are given to tools that would encourage a mode shift from auto use to walking, cycling, and transit; reduce peak-period congestion and associated air contaminants and particulate matter; and increase fuel-efficient or fossil-fuel-free travel.

Congestion Reduction	Higher scores are given to tools that reduce congestion through one of three primary levers: ▪ Location: Manage road travel at busy locations ▪ Time: Manage road travel at busy times of the day ▪ Distance: Manage or reduce total vehicle miles traveled
Implementation Feasibility	Higher scores are given to tools that could be implemented with greater ease, with lower technical challenges and risks, and with a better user experience (including understandability and convenience).

Scale

Score	Potential	What Defines the Score
1	Low	The tool can influence some or all of the elements associated with this criterion but only at a small magnitude relative to the other tools.
2	Moderate	On balance, the tool has moderate potential to influence this criterion.
3	High	On balance, the tool has high potential to meaningfully influence this criterion.

The scoring and rationale for each individual congestion pricing tool is provided below, followed by a summary table of these coarse screening results. Composite scores for each strategy, provided in the summary table, are the sum of each metric's individual scores, and can range between 8 and 24.

Cordon Pricing

Equity		Climate and Health		Congestion		Implementation	
Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Benefits	Within Seattle	Through Seattle	Ease	Cost
1	2	2	2	2	3	2	2

Evaluation Rationale:

Cordon pricing is a toll for vehicles crossing the boundary into a pricing zone. Although this measure could provide moderate funding resources for reinvestment in housing and affordability, it is not well-suited for equitably distributing the cost burden of the toll by exempting or targeting populations of interest. Furthermore, it is a "pay-to-play" strategy that may effectively exclude lower-income populations from accessing high-demand parts of the city. Abundant access to transit alternatives into and out of the cordon could mitigate this negative impact.

Cordon pricing can be varied over the course of the day to discourage vehicle use during the most congested hours. The cordon boundary can also be drawn around the most congested parts of the city, making it a flexible and effective option for reducing congestion at specific "hot spots." However, because the charge is incurred only upon *crossing* the cordon boundary, this strategy may not reduce trip *length* or discourage vehicle trips starting and ending *within* the cordon area—the larger the cordon, the greater this challenge becomes.

Implementation of this strategy may be challenging depending on the road network in question or the size of the cordon area. Areas with fewer entry or exit routes are better-suited for easy and cost-effective cordon implementation. Larger areas with many routes in or out result in higher

operating and capital costs, stemming from a higher number of gateways to maintain. may encourage drivers to circumvent payment points by diverting onto unmonitored side streets. Digital location trackers may address these implementation challenges without the need for excess on-street infrastructure, but they may also carry significant technical risks. The overall cost of implementation would depend on the size of the cordon, the choice of technology, and the complexity of the pricing scheme.

Recommendation: Include for Further Study

Cordon pricing is easier to implement than area pricing or road user charges, and can provide moderate funding resources for reinvestment in housing and affordability. However, known challenges include its flexibility in addressing equity goals or reducing vehicle travel within the target area.

Area Pricing

Equity		Climate and Health		Congestion		Implementation	
Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Benefits	Within Seattle	Through Seattle	Ease	Cost
2	3	2	2	3	3	1	1

Evaluation Rationale:

Area pricing is a toll for vehicles driving *within* a pricing zone. As with cordon pricing, this measure represents moderate reinvestment potential but may be difficult to use for precisely targeting or exempting particular populations. It also represents a "pay-to-play" strategy that could exclude populations who can't afford the charge from accessing high-demand parts of the city. Abundant access to transit alternatives into, out of, and within the priced area could mitigate this negative impact.

Area pricing charges can be varied over the course of the day to target the most congested hours, and the cordon itself can be drawn to target the most congested parts of the city, making it is a very effective congestion-reduction strategy. It is more effective than cordon pricing for reducing congestion *within* the cordon, and it encourages drivers to make both *fewer* trips as well as *shorter* trips.

Implementation of area pricing is likely to be more difficult than cordon pricing, as it requires either a sophisticated on-board monitoring technology for all drivers or an extensive on-street monitoring and tolling system within the congested area. An on-board system may be less effective in areas with large numbers of inter-regional drivers (who would not be typically equipped with the required monitoring technology).

Recommendation: Include for Further Study

Area pricing has a high potential to reduce congestion as well as a high degree of flexibility in pricing and program design, and further investigation into available technologies may reveal an opportunity to implement this strategy within the cost constraints of the project.

Fleet Pricing

Equity		Climate and Health		Congestion		Implementation	
Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Benefits	Within Seattle	Through Seattle	Ease	Cost
3	1	2	2	1	1	2	3

Evaluation Rationale:

Fleet pricing is a charge on specific vehicle types, such as taxis or freight vehicles. It can be a highly-targeted approach, which can help prevent the cost burden of the program from impacting low-income populations. However, a highly-targeted approach may also limit the reinvestment potential or congestion that could be eliminated with this strategy. For some target vehicle types, cost burdens could also be passed along to other users (for example, a fleet pricing strategy aimed at TNC drivers may be passed along to riders as part of the fare).

This strategy could be designed to discourage the use of certain types of high-polluting vehicles, which would improve local air quality and create positive health impacts. However, the narrow focus of this strategy limits the overall impact on regional health and congestion.

This strategy is likely to be easy and inexpensive to implement. Depending on the vehicle type that is targeted for fleet pricing, the charge could be incorporated into an existing registration fee or permitting process. A more sophisticated pricing scheme would require more resources for monitoring and enforcement.

Recommendation: Include for Further Study

Fleet pricing is a focused approach that can be used in conjunction with other strategies with low cost and resource requirements. Despite its composite score being lower than off-street parking pricing and tolling arterial roads, these attributes merit further study for this strategy in a paired implementation approach.

Road User Charge

Equity		Climate and Health		Congestion		Implementation	
Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Benefits	Within Seattle	Through Seattle	Ease	Cost
2	2	3	3	3	2	1	1

Evaluation Rationale:

Road user charges would replace the fuel tax with payment per mile traveled on downtown roads. This strategy can be designed to charge a flat fee per mile for all users of the road network, or it

can be designed to vary the fee depending on distance, time, location, or user type. A more flexible design would allow for a more equitable distribution of the cost burden of this strategy. The reinvestment potential is very high, but use of the revenue is likely to be highly competitive as fuel tax revenues decline and current fuel tax beneficiaries seek alternative revenue streams.

Climate and health impacts of this strategy are likely to be very positive, with a high potential for reducing vehicle miles traveled in the downtown area. Congestion within Seattle would likely be dramatically reduced, but the strategy may not have as large of an impact on congestion outside of the priced area. As with area pricing, implementation of a road user charge would require monitoring technology on board all vehicles within the target area, which would represent a significant cost and technological risk.

Recommendation: Include for Further Study

A road-user charge is likely to have a major impact on congestion with a high degree of flexibility and adaptability in pricing and program design.

On-Street Parking Pricing

Equity		Climate and Health		Congestion		Implementation	
Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Benefits	Within Seattle	Through Seattle	Ease	Cost
1	2	1	1	1	1	2	1

Evaluation Rationale:

On-street parking pricing would vary street parking prices to control demand. It is a supply-side strategy that has limited potential for targeting or exempting particular populations. As with cordon pricing and area pricing, parking pricing is a "pay-to-play" strategy that may disproportionately discourage, exclude, or burden lower-income populations from accessing high-demand parts of the city. Abundant access to transit alternatives could mitigate this negative impact.

Climate, health, and congestion benefits of this strategy alone are likely to be small. However, it could be used in conjunction with other measures or initiatives to discourage car ownership and encourage alternative travel modes. The ease and cost of implementing an on-street parking strategy depends on the existing parking payment technology and the sophistication of the pricing strategy desired—more dynamic pricing structures will require more sophisticated on-street technology and monitoring efforts.

Recommendation: Do Not Include

On-street parking pricing has limited potential to meaningfully reduce congestion or generate revenue to fund other mitigation efforts.

Off-Street Parking Pricing

Equity		Climate and Health		Congestion		Implementation	
Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Benefits	Within Seattle	Through Seattle	Ease	Cost
2	2	2	2	2	1	1	2

Evaluation Rationale:

Off-street parking pricing would apply a fee or tax to off-street parking lots. Off-street parking typically represents a large percentage of the parking supply in a downtown area, and is more likely to be associated with daily commute behavior than on-street parking. The potential for reducing congestion and providing health and climate benefits through an off-street parking fee or tax is moderate, though traffic passing through Seattle is unlikely to be impacted.

Implementing an off-street parking pricing program may be challenging, as cooperation with private parking facility owners and operators may be difficult and time-intensive. Monitoring and enforcement costs are likely to be higher than on-street parking pricing.

Recommendation: Do Not Include

Off-street parking pricing has more congestion reduction potential than on-street parking pricing, but may be better implemented as a transportation demand management (TDM) program through other city-led commute management efforts.

Arterial Toll Roads

Equity		Climate and Health		Congestion		Implementation	
Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Impacts	Within Seattle	Through Seattle	Ease	Cost
2	1	2	1	1	3	3	2

Evaluation Rationale:

Tolling arterial roads would charge a fee for all road users on major highways or surface streets. This strategy targets regional infrastructure, and therefore distributes the cost more consistently across residents from different areas. The reinvestment potential is significant, though it is inversely proportional to the congestion reduction impact—the more effective a toll is at discouraging driving, the less reinvestment potential it generates.

The congestion reduction potential is high, though it is likely to have a localized effect rather than regional congestion reduction impact. Implementation is relatively easy and cheap, and can be accomplished with widely-used and readily available technology.

Recommendation: Do Not Include

While tolling arterial roads has a high potential to reduce congestion through Seattle would be easy to implement, congestion reduction impacts are likely to be localized and long-term reinvestment potential is low.

Arterial Express Lanes

Equity		Climate and Health		Congestion		Implementation	
Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Impacts	Within Seattle	Through Seattle	Ease	Cost
1	1	1	1	1	2	2	3

Evaluation Rationale:

Creating arterial express lanes would involve converting some lanes on major arterial roads or highways to tolled lanes. These lanes offer drivers the option of paying a fee for a quicker commute. As a "pay-to-play" strategy, it is unlikely to provide equitable congestion reduction benefits or heath and climate impacts. Though this strategy is relatively easy and inexpensive to implement, reinvestment potential and congestion reduction impacts are likely to be low and localized.

Recommendation: Do Not Include

Arterial express lanes are unlikely to significantly reduce congestion or provide other public benefits.

Connected/Autonomous Vehicle Zone

Equity		Climate and Health		Congestion		Implementation	
Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Impacts	Within Seattle	Through Seattle	Ease	Cost
1	1	1	1	1	1	1	1

Evaluation Rationale:

A connected/autonomous vehicle (AV) zone would designate a certain area or portion of the street network for the exclusive use of connected/autonomous vehicles. This strategy is unlikely to be effective at reducing congestion or providing additional health, climate, or equity benefits. High projected initial cost of autonomous vehicle ownership would exclude lower- and middle-income populations from use of a connected/autonomous vehicle zone in the near-term, which would be detrimental to Seattle's equity goals.

The timeframe during which this strategy would be effective at reducing congestion is narrow, requiring a sufficiently high number of AV users to justify dedicating road space for exclusive use but a low enough number of users to make access to such a space a "special" benefit. As AV market penetration increases, congestion levels in the connected/autonomous vehicle zone could likely return to pre-program levels or worse.

Recommendation: Do Not Include

Designating a connected/autonomous vehicle zone for exclusive use is unlikely to be an effective congestion mitigation strategy in the near- or long-term.

SUMMARY FINDINGS

Four tools are recommended for further study:

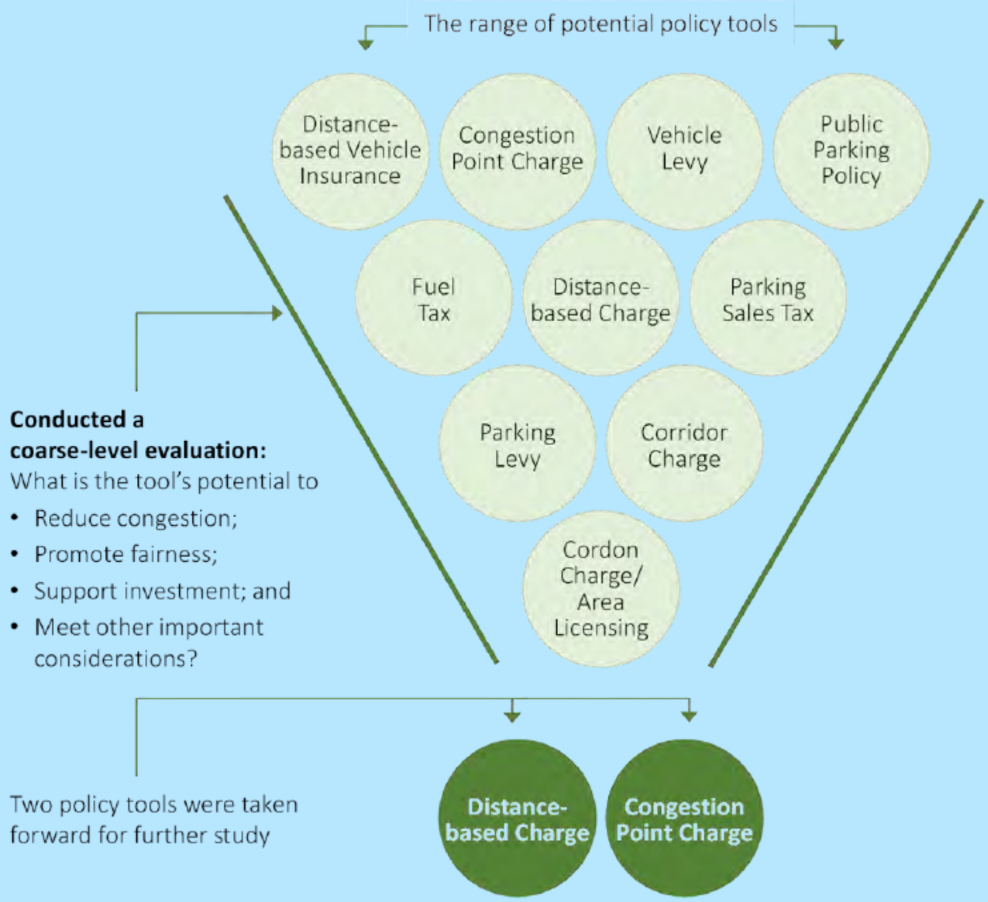
- Cordon Pricing
- Area Pricing
- Fleet Pricing
- Road User Charge

These stand out as tools with the most individual potential to meaningfully influence and balance across the draft goals. While fleet pricing is not one of the top scoring tools, its highly-targeted approach, relative ease, and low cost to implement merits evaluating it further as a possible complementary strategy. Fleet pricing could be an effective supplement, coupled with one or more of the other three recommended tools.

Pricing Tool	Composite Score	Equity		Climate and Health		Congestion		Implementation	
		Equitable Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Benefits	Within Seattle	Through Seattle	Ease	Cost
Cordon Pricing Toll for vehicles crossing the boundary into a pricing zone	16	1	2	2	2	2	3	2	2
Area Pricing Toll for vehicle driving inside a pricing zone	17	2	3	2	2	3	3	1	1
Fleet Pricing Targeted pricing of specific vehicle types	13	3	1	2	2	1	1	2	3
Road User Charge Replace fuel tax with payment per mile traveled on downtown roads	17	2	2	3	3	3	2	1	1
On-Street Parking Pricing Vary street parking prices to control demand	10	1	2	1	1	1	1	2	1
Off-Street Parking Pricing Apply a fee/tax to off-street parking lots	14	2	2	2	2	2	1	1	2
Arterial Toll Roads Price entire roads	15	2	1	2	1	1	3	3	2
Arterial Express Lanes Convert some lanes to tolled lanes	12	1	1	1	1	1	2	2	3
Connected/Autonomous Vehicle Zone Create connected/autonomous vehicle-only zones	8	1	1	1	1	1	1	1	1

Appendix A Case Study: Vancouver, BC

Vancouver has mounting congestion, continued population growth, and two bridges that were tolled while others were not, leading some to drive extra distances to avoid the cost. While some type of bridge tolling or congestion charging seemed a likely outcome, Vancouver created an Independent Pricing Commission that studied a broad range of alternatives. They first adopted a set of transportation goals that included promoting fairness in transportation costs and impacts. They then evaluated which alternatives, if any, could best achieve their goals. After detailed analysis and community input, they settled on the two potential alternatives that seemed to be the best fit: distance-based charges and congestion point charges (similar in principle to cordon charges).



SEATTLE CONGESTION PRICING STUDY

Draft Executive Summary (1/23/19)

Introduction

The City of Seattle is exploring congestion pricing as a way to address traffic congestion and reduce greenhouse gas emissions. Seattleites spend more time commuting than people in most major U.S. cities, at a cost of $5 billion each year. The transportation system is the greatest contributor to greenhouse gas emissions: 66% of emissions citywide come from transportation (Figure 1). Congestion pricing is one potential tool for addressing these challenges, but it requires careful study and thoughtful design to ensure that such a program is equitable, transparent, and responsive to Seattle's needs.

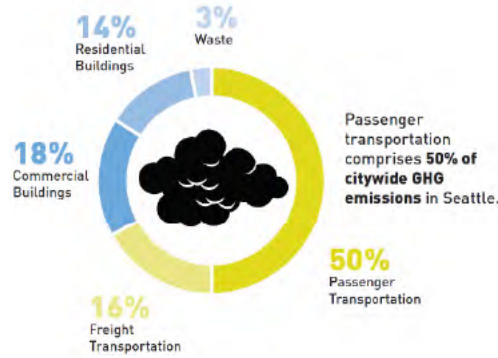


Figure 1 Seattle Greenhouse Gas Emissions by Source

The current phase of the Seattle Congestion Pricing Study answers key questions about possible congestion pricing program designs for Seattle, including [redacted] the potential impacts and benefits. These efforts build on lessons learned from other cities around the world and North America that have implemented or are studying congestion pricing. The analysis relies on existing data—which is quite limited at this time—and a preliminary definition of project goals and desired outcomes to screen potential pricing tools and explore preliminary equity impacts and benefits of select tools.

The initial findings are presented in a series of draft technical memoranda and white papers:

- Pricing Opportunity Statements
- Tools, Technologies, Privacy Considerations, and Legalities
- Screening Potential Pricing Tools
- Best Practices in Communications and Messaging
- Creating a More Equitable Pricing Program
- Preliminary Impacts and Benefits

These white papers answer select questions about a potential congestion pricing program in Seattle, but they are just the beginning. They offer guidance for scoping the next phase of the study, including a significant focus on engaging with Seattle and regional residents, businesses, and visitors and deepening the analysis to gain a better understanding of impacts and benefits.

The Executive Summary includes highlights of the Phase 1 study, focused on lessons learned, the pricing tools that appear to be the most promising for Seattle, select equity impacts, best practices in messaging and communications, and next steps for future phases of work.

Learning from Peers

More than a dozen cities have implemented, seriously considered, or are actively studying congestion pricing, which is sometimes referred to as mobility pricing or road pricing. This section highlights lessons learned and the results of successful congestion pricing programs and shares features of two U.S. programs currently under study:

- All cities that have implemented congestion pricing have built on aggressive transportation demand management programs

- All implemented congestion pricing programs have explicitly intended to reduce congestion and/or emissions
- Most programs provide a revenue stream that funds transportation options and services
- Public and business acceptance typically rises dramatically post-implementation

One of 300 buses added to London's fleet after congestion pricing roll-out

Implemented congestion pricing tools include low-emissions zones (LEZ), congestion charges (CC), electronic road pricing (ERP), and GPS-based road pricing (GPS ERP). In every case, congestion pricing has reduced vehicle trips (by 10% to 44%), reduced CO2 emissions (by 2.5% to 22%), and lowered travel times (by 10% to 33%). Revenues generated are almost exclusively reinvested into transit or other mobility options. Figure 2 summarizes five implemented congestion pricing programs and their results.

Figure 2 Major Cities with Congestion Pricing Programs

	Stockholm	London	Singapore	Milan	Gothenburg
Mechanism	LEZ – 1996 CC – 2007	CC – 2003 LEZ – 2008	ALS – 1975 ERP – 1998 GPS ERP – 2017	LEZ – 2008 CC – 2012	CC – 2013
Time to Prepare	Four years	Three years for CC	13 years for ERP	Two years for LEZ	Nine years
Trip Reduction	22%	16% all 30% charged	15% with new technology 44% in 1975	34%	10%
GHG Reduction	14% CO2	17% CO2	15% CO2	22% CO2	2.5% CO2
Travel Time	33% reduction in delays	30% reduction in delays	Managed through pricing	30% reduction in delays	10% to 20% faster travel time in corridors
Net Annual Revenue	$150M	$230M	$100M	$20M	$90M

Congestion pricing's success abroad has encouraged many U.S. cities to explore pricing as a possible tool. New York City has completed in-depth studies and is close to implementing a phased approach (Figure 3), while Washington State has a Road User Charge (RUC) pilot project underway with roughly 2,000 participating drivers. San Francisco, Vancouver B.C., Oregon, Portland (OR), and Los Angeles are also aggressively studying congestion pricing.

Figure 3 New York City's Phased Approach to Congestion Pricing

Foundation: Regulation and transit improvements → For-Hire Vehicle Charge: Estimated to raise $200M → Zone Pricing: Estimated to raise $800M

Key Findings

This phase of the Seattle Congestion Pricing Study has identified and evaluated the universe of available pricing tools, screened these tools for applicability to Seattle, and explored ways to ensure a pricing system is equitably implemented. A high-level analysis of the impacts and benefits of an area pricing system has been completed, and additional analysis focused on fleet pricing is underway. Peer cities' experiences and lessons learned with messaging and communications for congestion pricing have also been reviewed to inform development of a possible approach for Seattle. Introductions to these findings are below, and much more detail is available in the companion draft white papers on each topic.

Pricing Tools, Technology, Privacy, and Legalities

A comprehensive review of pricing tools identified 11 options that have been used in other cities, their potential applicability to Seattle, and associated technologies, privacy considerations, and legalities (Figure 4).

Figure 4 Potential Pricing Tools

Pricing Tool	Description
Cordon Pricing	Charge vehicles for crossing a boundary into pricing zone
Area Pricing	Charge vehicles for crossing a boundary *and* for driving inside a pricing zone
Fleet/Vehicle Class Pricing	Charge specific vehicle types entering a zone, such as ride-hailing or commercial vehicles
Connected/Autonomous Vehicle (C/AV) Zone	Create a zone that allows only licensed connected and/or autonomous vehicles
Fossil Fuel Free Zone (FFFZ)	Create a zone that allows only licensed non-fossil fuel vehicles
License Plate-Based Restriction Zone (LPRZ)	Restrict access to a zone based on license plate numbers
Road User Charge (RUC)	Restrict access to a zone to vehicles enrolled in a RUC program that replaces fuel tax with a per-mile charge, by time of day, and/or location
Arterial Toll Roads	Toll arterial roads
Arterial Express Lanes	Convert or add lanes on arterial roads as tolled facilities
On-Street Parking Pricing	Vary street parking prices to control demand
Off-Street Parking Pricing	Apply a variable fee/tax to off-street parking facilities

Technology and Privacy

A number of technologies exist—and are used in other cities—to implement these pricing tools. Depending on the specifics of a pricing program, a congestion pricing system may require onboard vehicle identifiers, roadside or overhead detectors, and back office equipment. Technology considerations, such as maturity, physical footprint, interoperability, scalability, and flexibility warrant further study to optimize feasibility and cost-efficiency.

Privacy is a frequently-raised concern in congestion pricing policy discussions, as pricing typically requires identifying vehicles to enforce a charge. Concerns are generally related to access and storage of personally-identifiable information (PII), such as unique vehicle and owner data. Technologies can be designed and regulated to safeguard PII using methods such as proprietary internal identifiers, encryption, and anonymized/aggregated geodata. Credit card industry regulations can further ensure

anonymity, and customer education and transparent privacy agreements are important for raising awareness of privacy protections. An existing City of Seattle surveillance ordinance addresses some of these concerns by mandating public transparency when the City considers the acquisition of technology that may be considered surveillance.

Pricing Tool Screening

These privacy and technology considerations were incorporated into a high-level screening of the 11 potential pricing tools. The screening was conducted using the criteria in Figure 5, which were developed based on draft goals and desired outcomes for congestion pricing.

Figure 5 Screening Criteria

Draft Goals	Draft Desired Outcomes
Equity	▪ Potential to reinvest resources to enhance equity and affordability ▪ Opportunity to increase and improve transportation options for low-income populations ▪ Could provide opportunities for inclusive decision-making around mobility options
Climate and Health	▪ Potential to change travel behavior to support active and sustainable modes ▪ Likelihood of decreasing peak-period congestion and reducing particulate matter ▪ Presents opportunity to encourage more fuel-efficient and fossil-fuel-free travel
Traffic Congestion	▪ May increase predictability and reliability of travel in Seattle for people and goods
Implementation	▪ Consideration of overall feasibility, technologies, legalities, and potential efficiencies

This coarse screening identified the following tools for further study:

- **Cordon Pricing: Inter-Zone Travel –** Cordon pricing is likely to reduce trips *into* Seattle's Center City. The concept is relatively simple to explain and requires less infrastructure than area pricing. It may deter people from some high-demand areas, presenting equity concerns, though additional transit service and/or targeted discounts could mitigate impacts for lower-income travelers.

Congestion charge billboard in London, showing cordon

Cordon camera in London

- **Area Pricing: Intra-and Inter-Zone Travel** – Area pricing captures intra-zonal travel, meaning more trips and more equitable impacts. It encourages both *fewer* and *shorter* trips. It requires more infrastructure than cordon pricing but is likely to generate more revenue. As with cordon pricing, it may exclude people from high-demand areas. Additional transit service and/or targeted discounts could mitigate impacts.
- **Fleet Pricing: Targeted Approach –** Fleet pricing targets specific vehicle types, making congestion reduction and revenue generation potentially limited. It is relatively easy to implement, as many fleet vehicles are already permitted/registered. A mitigation program could be highly-targeted, although the types of vehicles charged should be carefully considered.

- **Road User Charge: Vehicle Miles Traveled Focused** – A Road User Charge is most directly tied to road use and has a very high potential for congestion reduction. It is relatively easy to tailor to achieve specific outcomes (and avoid impacting certain populations), and there may be opportunities to partner with Washington State's pilot program. Enforcement is relatively challenging.

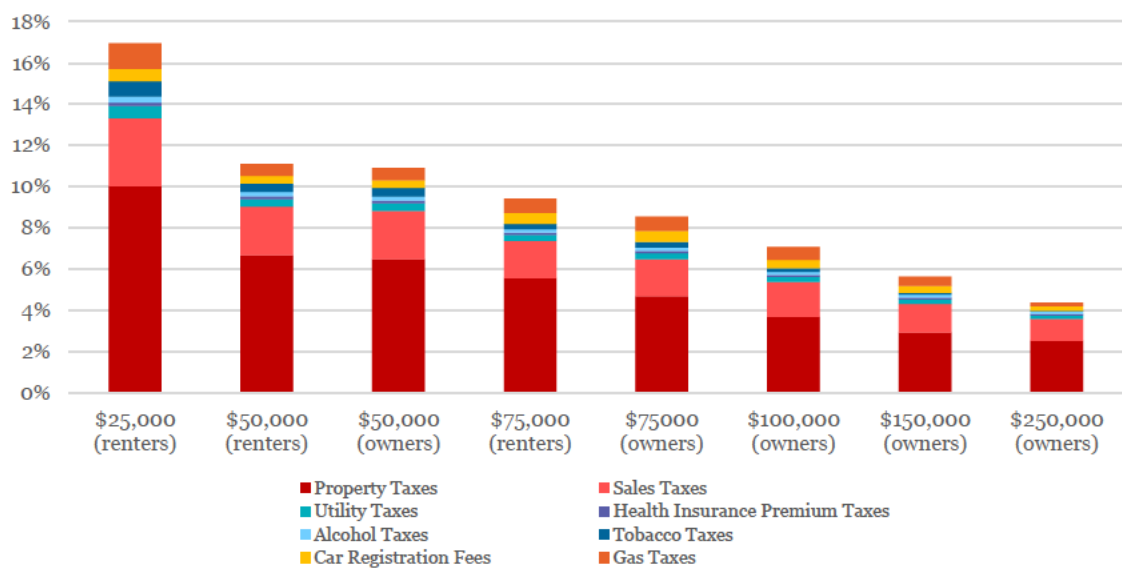
Initial Equity Impacts and Benefits Analysis

The preliminary impacts and benefits analysis begins from a baseline understanding of regional transportation equity and considers the four pricing tools identified through the high-level screening discussed above. This allows for benchmarking of potential congestion pricing to the current distribution of transportation costs and benefits.

Current State of Equity

Seattle and Washington State's revenue collection methods—including those for transportation—are highly regressive, collecting a far greater percentage of income from low-income households than from wealthy ones (Figure 6). This reality strengthens the case for a congestion pricing system that is sensitive to the equity implications of its impacts and benefits.

Figure 6 Percent of Income Directed to Taxes by Seattle Household Type, 2016



Source: Economic Opportunity Institute, 2018. "Who Really Pays: An analysis of the tax structures in 15 cities throughout Washington State". p. 34. <http://www.opportunityinstitute.org/_v1/wp-content/uploads/2018-EOI-Income-Tax-Brief.pdf>

Impacts and Benefits

These existing inequalities, along with an understanding of historic discrimination in transportation and land use planning against racial and ethnic minorities, are foundational elements of this impacts and benefits analysis. Data for this high-level analysis are limited and largely regional in scale, meaning fine-grained results are only possible once specific pricing tools, methods, and geographies have been identified for further study. When these details are established, resources can be directed to more precise data collection and analysis.

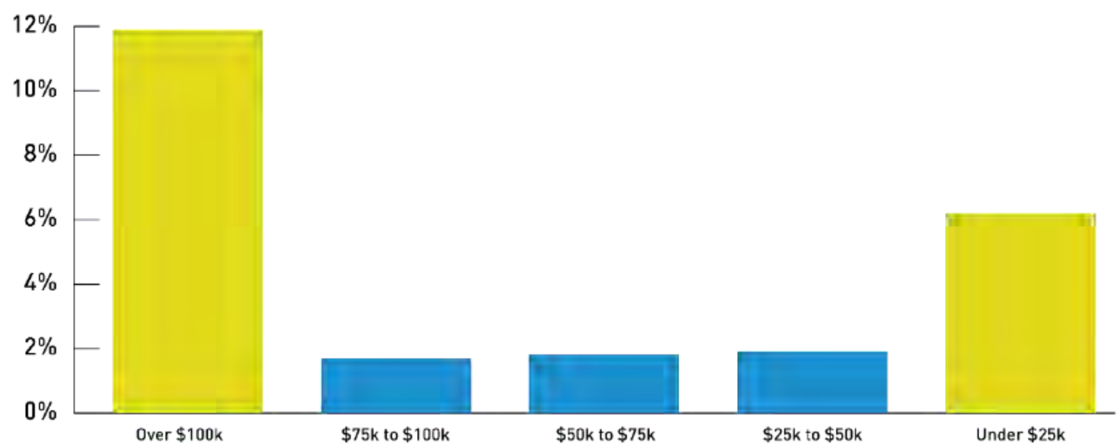
Figure 7 Potential Area Pricing Zone

As of this writing, preliminary impacts and benefits analyses have been conducted only for a potential area pricing system, where people driving would be charged for traveling into or within a defined geography (see Figure 7). SDOT has recently received access to additional data, opening the door for a preliminary fleet pricing analysis that would assess the impacts and benefits of a congestion charge for vehicle types or fleets operating within a specific area.

Using data from PSRC's household travel survey, potential implications of an area pricing system have been determined. Given the regional scale of the dataset, these results should be interpreted only as high-level findings that must be enhanced through more rigorous analysis.

An area pricing system is likely to most disproportionately impact higher-income households (which likely have a greater ability to pay), with a secondary impact to the lowest-income households (which may have a lesser ability to pay) (Figure 8). Middle-income households are likely to be the least affected by an area pricing system.

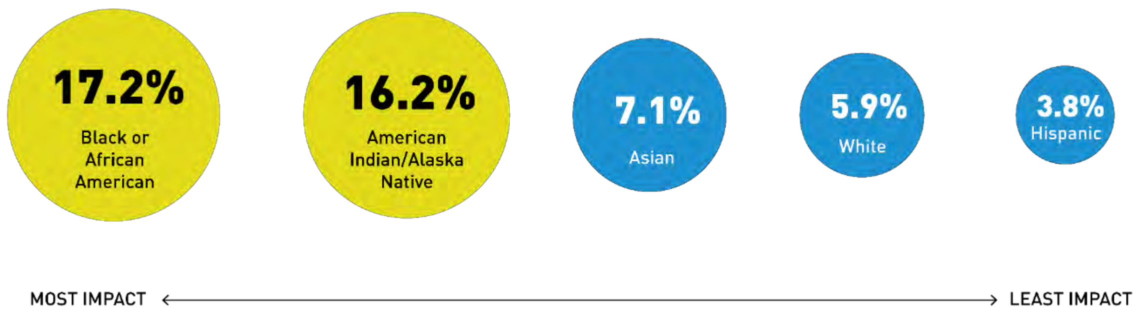
Figure 8 Percent of PM Peak Trips Impacted by Pricing, by Household Income



Source: PSRC Spring 2017 Household Travel Survey. Universe: PSRC county households.

The same assumed geography for area pricing may disproportionately impact black and Native American travelers, and least disproportionately impact Hispanic/Latino travelers (Figure 9). Again, this is based on proportions of travelers rather than an established disproportionate impact, which is impossible to determine without further definition of the pricing program.

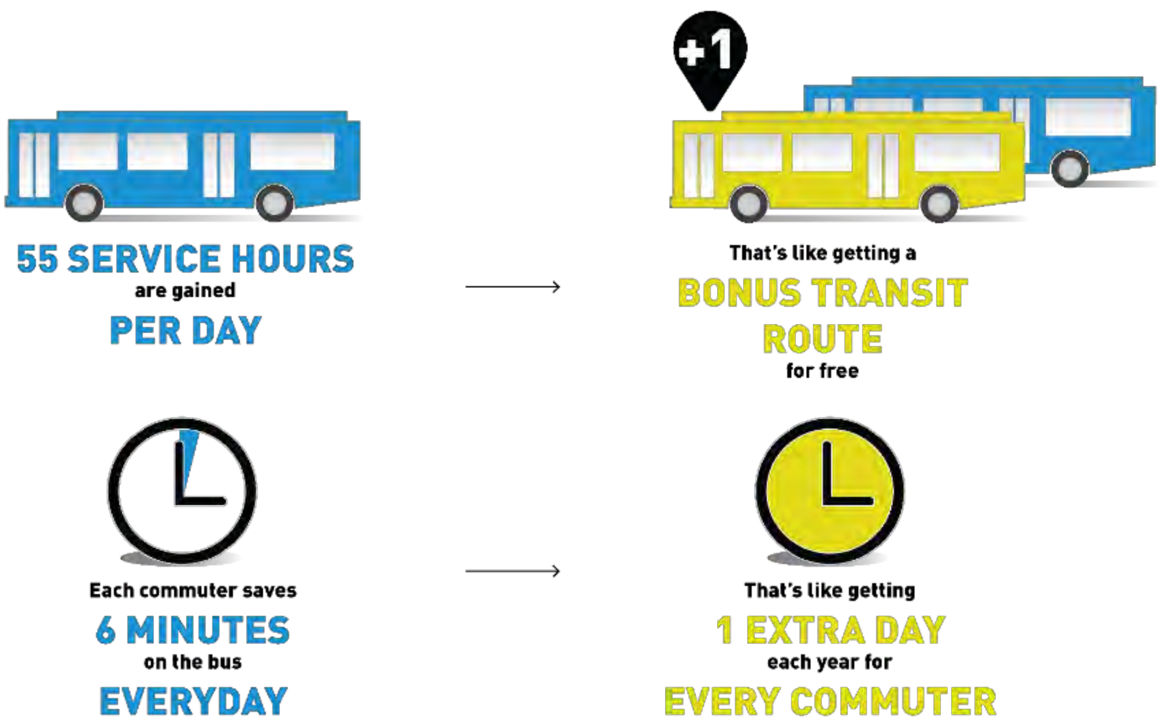
Figure 9 Percent of PM Peak Trips Impacted by Pricing, by Race/Ethnicity



Source: PSRC Spring 2017 Household Travel Survey. Universe: PSRC county households.

Compared to the general population of King County, transit riders (on King County Metro services) are more likely to be older, lower-income, and people with disabilities. Therefore, congestion pricing benefits for transit may have a positive impact on regional equity. These benefits could include reduced transit travel times, which saves commuters time and frees transit service hours that could be reinvested in the system (these benefits estimated in Figure 10).

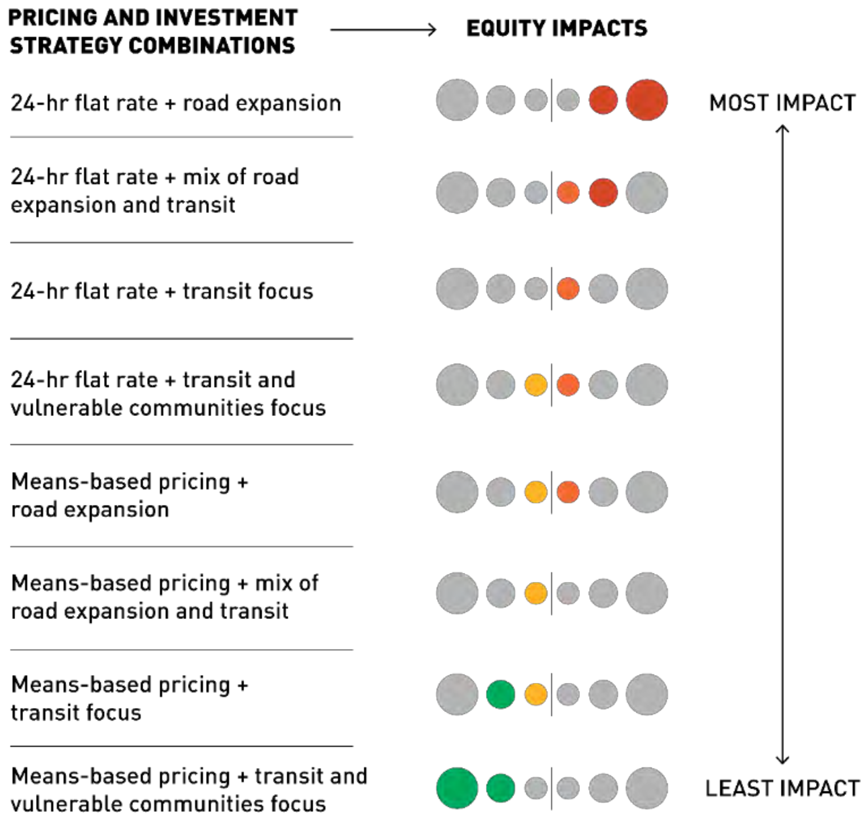
Figure 10 Potential Area Pricing Benefits for Public Transit



The potential impacts and benefits suggested by these analyses are still very preliminary and would vary widely depending on the specific design of a congestion pricing program in Seattle. A more in-depth analysis, based on specific pricing details (such as exact geography, methods, prices, and thresholds) will allow more accurate prediction of likely impacts and benefits.

The equity impacts and benefits of congestion pricing will depend largely on program design (see Figure 11). Any pricing program can be structured in a way that is more or less equitable. Structuring pricing to reduce the impacts on specific communities of concern, such as low-income households, can make a pricing program more equitable. Likewise, investing revenues generated by pricing into carefully-chosen programs, such as public transit and traffic safety, can offset negative outcomes and provide benefits to historically-disadvantaged communities.

Figure 11 Reducing Equity Impacts through Program Design



Messaging and Communications

Other cities' recent experience implementing congestion pricing shows that effective communication and messaging are key to success. Implementing a pricing program is challenging; public support can be expected to drop prior to the launch of a pilot program and to rise again after the public experiences benefits. Successfully-implemented programs have used messaging and communications strategies that are goal- and solution-oriented, tailored to specific stakeholders, and simple to understand. Best practices suggest the following approaches:

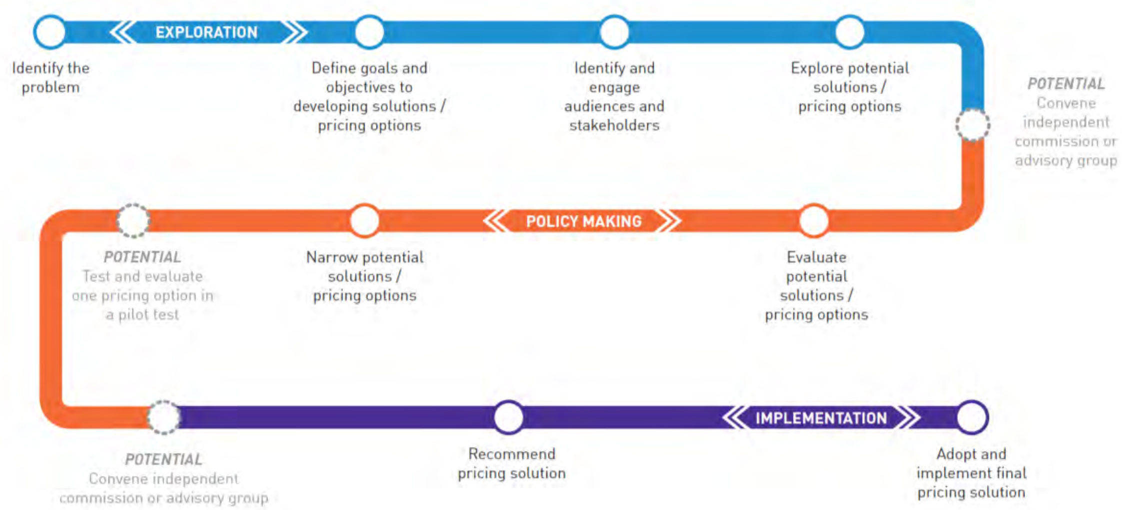
- Goal- and Solution-Driven Messaging: Identify a focused set of goals (i.e., problems to be solved) that congestion pricing will strive to achieve and use these goals as the messaging focus throughout exploration, policy-making, and implementation. Stockholm and London both established clear messaging around goals early in their processes. Though public support varied throughout the policy-making phase, high-level messaging and communications of goals was consistent; in Stockholm, public support ultimately skyrocketed after implementation of a pilot program.
- Understanding Audiences and Stakeholders: Engage a variety of audiences early and regularly, especially potential supporters, skeptics, and populations that may be (or perceive themselves as) adversely affected. Washington State began discussion and outreach for its road user charge program 10 years before implementing a pilot program. This process was highly participatory and produced more than 2.5 applicants for each slot available in the pilot.

- Clear Communications and Materials: Develop communications that support pricing goals and messaging, are tailored to specific audiences, and reflect the stage of policy development. In New York City, pricing advocacy group MoveNY created factsheets for specific neighborhoods and outer-borough areas, explaining the benefits of a congestion pricing program to small geographies on an individual basis.

Seattle is well-positioned to execute these communications approaches and should initiate a thorough engagement process in the coming months. The major communications and messaging next steps for the City are detailed below and shown in Figure 12:

- Define the purpose and goals for congesting pricing and form a messaging and communications strategy around them
- Develop a full public engagement and communications strategy with an equity focus
- Tie congestion pricing messaging to transit investments and improved travel alternatives
- Ensure authentic opportunities for feedback and demonstrate incorporation of feedback
- Consider an independent commission to evaluate policy options
- Consider a pilot program

Figure 12 Milestones for Communications and Messaging



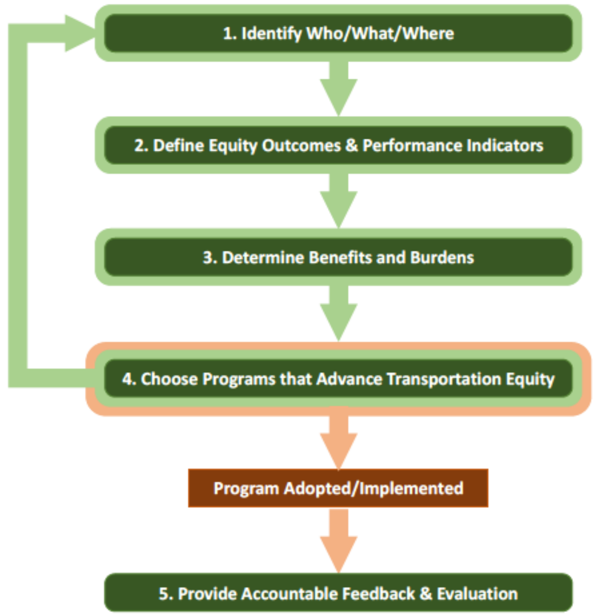
Next Steps

With this initial phase of work nearing completion, Seattle has a clearer sense of the types of pricing programs that may merit further exploration. To support the next phases of study, the following next steps are recommended:

- Articulate Clear, Prioritized Goals: To support more robust analysis of a potential pricing program, the City should work with the public and key stakeholders to clearly articulate values that define what such a program should achieve. To date, congestion reduction, climate impact mitigation, equity, livability, revenue potential, and ease of implementation have been discussed as possible goals. No single pricing program can achieve all of these, making their definition—and prioritization—particularly important.
- Begin Public Engagement: Based on lessons learned from cities that have studied or implemented congestion pricing, it is clear that starting the public dialogue early in the process is critical. With preliminary questions answered, the City should now establish an outreach approach and begin conversations with stakeholders.

- **Develop an Equity Strategy:** Every pricing program has impacts and benefits. And any potential congestion pricing program in Seattle would be implemented in the context of a transportation system that is already inequitable. By working in partnership with the community to develop a comprehensive equity strategy around pricing, the City can ensure that both the planning process and any future program are inclusive and equitable. Designing an equitable pricing program will require deep engagement, extensive analysis, careful program design, and appropriate supports and mitigations.

Figure 13 Key Steps in Developing an Equitable Pricing Program



- **Continue Impacts and Benefits Analysis:** New data are now available, including recently-gathered datasets on vehicle fleets that could support preliminary analysis of a fleet pricing tool. As the City gains clarity on the types of pricing programs that best meet its goals, additional impacts and benefits analysis can begin. A narrower set of pricing programs—with parameters around geography, time of day, and price levels—will support a deeper understanding of possible outcomes. Moving forward, it will be necessary to gather new data and create new pricing-specific models and tools that will enhance understanding of the impacts and benefits of any program.
- **Identify Supportive Projects and Programs:** To establish a successful and equitable pricing program, the City must begin to identify projects, programs, and services that would be required to support implementation. These may include providing more transit service, which would increase people's travel options, or establishing a mobility credits program that rewards people for traveling outside of peak periods. While these supports are sometimes considered as post-implementation mitigations, they must be identified early in the planning process to fully evaluate their potential efficacy.

Much work remains before Seattle will be ready to implement congestion pricing. This initial phase of work has identified potential pricing programs, established the need for clear goals and additional analysis, and articulated an approach to developing an equitable and just program.

DRAFT PRICING TOOLS, TECHNOLOGIES, AND LEGALITIES WHITE PAPER (1/21/19)

Introduction

In response to increasing road traffic congestion and the realization that metropolitan regions cannot build themselves out of this problem, a variety of congestion pricing solutions have been piloted and adopted globally. The City of Seattle is among several cities in North America that recognizes pricing's potential to reduce congestion and improve mobility, leading the Seattle Department of Transportation (SDOT) to explore potential tools and their application in other places. This white paper provides a summary of congestion pricing tools, their objective merits and drawbacks, how they might be applied to the City of Seattle given current legal frameworks and existing and emerging technologies.

Background

Congestion pricing uses the economic principle of supply and demand to manage traffic. By applying an additional cost to using a certain mode of transportation at congested times and locations, a municipality can encourage travelers to reconsider their transportation choices. A small reduction in the number of vehicles on a congested road can translate to a big reduction in congestion. Additionally, as one mode of transportation becomes more expensive, alternative transportation modes can become relatively more attractive. For example, increasing prices on a tolled road during rush hour can make the choices of taking transit, carpooling, shifting travel times, using a different route, or eliminating the trip altogether more attractive than paying the higher toll. Which option a traveler will choose depends on their value of time for that trip, budget, availability of alternatives, and other preferences.

The City of Seattle is evaluating the range of available pricing tools to determine which best meet the goals of providing congestion relief, reducing climate impacts, and improving health and equity. Some tools may achieve certain objectives better than others. The City may consider using discounts and exemptions in combination with any of the pricing tools to further influence behavior or to support multiple objectives. Discounts and exemptions can mitigate negative equity impacts or provide further incentives for travelers to choose a certain transportation mode.

Ultimately, the City will need a combination of tools to achieve its goals, as no single tool can do everything. Choosing multiple pricing tools and discount strategies increases policy complexity and the challenge of communicating with travelers, implementing the program, and ensuring payment. Increasing complexity can also make enforcement more difficult, allowing more opportunity for people to cheat the system. The next sections summarize the pricing tools shown in Table 1. This is followed by a discussion of technologies, as well as legal implications of the various tools.

Table 1. Pricing Tools Summary

Pricing Tool	Description
Cordon Pricing	Charge vehicles crossing the boundary into a cordon pricing zone
Area Pricing	Charge vehicles crossing the boundary and driving inside an area pricing zone

Pricing Tool	Description
Fleet/Vehicle Class Pricing	Apply targeted pricing to specific vehicle types entering a zone, such as ride-hailing fleets or commercial vehicles
Connected/Autonomous Vehicle (C/AV) Zone	Create a zone that allows only licensed connected/autonomous vehicles
Fossil Fuel Free Zone (FFFZ)	Create a zone that only allows licensed non-fossil fuel vehicles, such as all electric and hydrogen vehicles
License Plate-Based Restriction Zone (LPRZ)	Restrict vehicle access into a zone based on vehicle license plate numbers
Road User Charge (RUC)	Restrict access to a zone to vehicles enrolled in a RUC program that replaces fuel tax with payment per mile traveled, by time of day, and/or location traveled
Arterial Toll Roads	Price entire arterial roads
Arterial Express Lanes	Convert or add some lanes on arterial roads as tolled lanes, such as converting bus-only lanes or an existing general-purpose lane
On-Street Parking Pricing	Vary street parking prices to control demand
Off-Street Parking Pricing	Apply a variable fee/tax to off-street parking facilities

Pricing Tools Overview and Applicability to Seattle

The sections that follow describe each of the tools shown in Table 1, identify how the tool might be applied in Seattle, and introduce potential pros and cons associated with possible implementation.

Cordon Pricing

Cordon pricing is the concept of charging vehicles a fixed or variable toll for entering and/or exiting a congested zone within a city. Pricing can vary according to vehicle type (e.g., private or commercial vehicles, cars or trucks) and by time of day (e.g., depending on traffic conditions). Typically, tolling equipment is placed on all roads leading into and out of a cordon zone. Toll collection equipment at cordon boundaries identifies vehicles through the use of toll transponders and/or license plate recognition camera systems, and toll amounts are either deducted from toll accounts or are sent to vehicle owners as toll invoices. Cordon boundaries are selected to optimize benefits as defined within the policy, minimize unwanted effects such as diversion, and balance the cost of tolling infrastructure. Cordon pricing in Singapore and Stockholm has reduced congestion, reduced emissions, and generated revenue for reinvestment in the transportation system.

Figure 1. Tolling gantry with transponder and license plate camera used for cordon and area pricing

Applicability to Seattle

The size and extent of a cordon pricing zone in Seattle could vary depending on the desired amount of or locations for congestion reduction (and other program objectives). One possibility is a cordon zone

bounded by the waterfront, I-5, Pine Street, and South Jackson Street; this zone would leverage the waterfront and I-5 as barriers, minimizing the number of access points into the zone. If the system were to charge only vehicles entering the cordon zone, then downtown Seattle's one-way streets would further reduce the number of tolling points needed. Alternatively, the waterfront, I-90, Lake Washington, and the bridges across the Ship Canal (i.e., the Ballard, Fremont, University, and Montlake bridges) could serve as the boundaries of a much larger cordon zone.

Pros

Cordon pricing is easy to explain to the public and effective at reducing traffic into a zone. In addition, cordon pricing can be applied in a very flexible manner to support achieving nuanced goals like reducing congestion during certain time periods or reducing congestion caused by specific vehicle types. The tolling infrastructure could also be used for other purposes, such as augmenting traffic data feeds and enlarging the City's communications network. Finally, cordon pricing could generate revenue that would more than offset implementation and operations costs and likely generate a revenue stream for reinvestment in the transportation system.

Cons

To ensure collection of a toll from every vehicle crossing the cordon, the City would need to install a significant amount of roadside toll collection equipment and establish back-office functions; both have high up-front capital costs and ongoing operations costs. The location of charge points would need to be carefully chosen to avoid unwanted boundary effects, such as diversion that could increase traffic in neighborhoods adjacent to the cordon zone. To be effective, travelers must know what they will pay at the point when they are making decisions about travel mode or time. Therefore, to take advantage of dynamic pricing approaches that respond to congestion levels or air quality or those that vary by vehicle type or income level, Seattle would need robust strategies for communicating the pricing structure.

Area Pricing

Area pricing is very similar to cordon pricing. It has the added feature of also charging vehicles that drive *within* a pricing zone, not just those crossing the zone's boundary. This approach is best suited for geographically large pricing zones where vehicles driving within a zone may not necessarily cross the zone's boundary but still contribute to congestion. Area pricing relies on tolls collected electronically with tolling equipment placed at strategic locations within a pricing zone and as well as at its boundaries. London has successfully implemented an area pricing program.

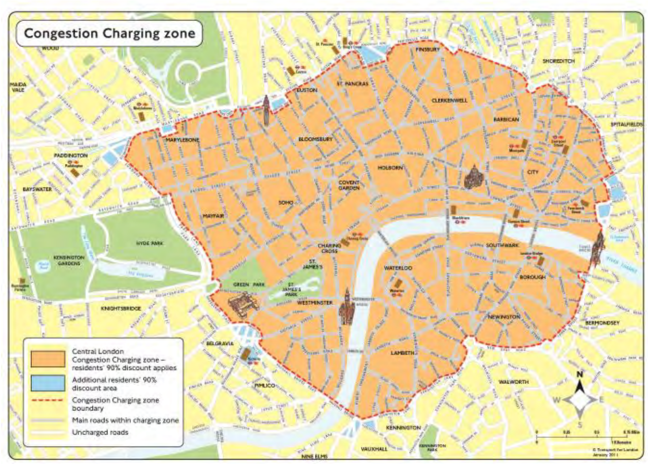


Figure 2. **Map of London's area pricing zone**

Applicability to Seattle

Similar to cordon pricing, area pricing would target Seattle's more congested downtown center but would likely be much larger in size, such that vehicle trips originating and staying within the zone would also be charged (to capture their role in contributing to congestion). Area pricing would be more effective than cordon pricing because it would capture vehicles that stay within the zone throughout the day, such as ride hailing and delivery vehicles.

Pros

In addition to the benefits of cordon pricing, area pricing can make a pricing structure fairer since it applies to those within the cordon as well as those traveling into the congested (and priced) area.

Cons

To achieve the extra benefits mentioned above, area pricing is more complex and requires more infrastructure than cordon pricing; therefore, it has higher capital and operating costs. As the congested area (and the area priced) grows larger, area pricing could bring more benefits and become more cost effective.

Fleet/Vehicle Class Pricing

Fleet pricing prices certain types of vehicles charging a fee or toll for driving in a particular area. Pricing a large enough fleet of vehicles could reduce the number of vehicles in a congested area and improve traffic flow. For example, pricing delivery vehicles could alter traffic disruptions caused by deliveries during rush hour. In addition, pricing vehicle classes that emit greater levels of pollution could reduce their use and have a positive effect on air quality. Imposing a fee or a toll on vehicles can be done as part of annual vehicle registration or with on-board vehicle use monitoring devices, such as fare collection systems in taxis or truck GPS units. On-board vehicle devices allow prices to vary by time of day. New York City is implementing fleet pricing on taxis and other ride-hailing services. Many parts of Europe have truck-specific tolls in place to cover the costs of road operations and maintenance.

Figure 3. Example of tolling equipment used for truck tolling in Germany

Applicability to Seattle

Seattle could leverage the current ride-hailing and taxi regulatory and licensing framework to add charges by time of day or location. To price commercial vehicles, the city could engage the Port of Seattle and trucking associations to develop a methodology. An example of targeted truck pricing would be applying a container truck toll charge similar to the Pier Pass program at the Port of Los Angeles and Port of Long Beach.

Figure 4. Port of LA terminal gate associated with the Pier Pass pricing program

Pros

Fleet pricing can be implemented relatively easily, especially if it leverages existing systems or infrastructure like vehicle registration or ride-hailing service payment systems. Vehicle class pricing could allow Seattle to target high emission vehicles in addition to congestion, directly supporting multiple city goals. Like cordon and area pricing, fleet pricing could generate sufficient revenues to offset the costs of implementing the program. Fleet pricing would pair well with other congestion pricing options.

Cons

Focusing only on vehicle fleets and vehicle classes may not impact enough vehicles to have a measurable effect on congestion or air quality. In addition, operators with low margins, such as owner-operators of port drayage trucks, may be more likely to drive high emission vehicles without the means to meet stricter emissions standards, so targeting such vehicles may be an inequitable solution.

Connected/Autonomous (C/AV) Vehicle Zone

A cross between a vehicle restricted zone and fleet pricing, a C/AV zone would allow only licensed connected and autonomous vehicles into a zone that is otherwise restricted to pedestrians, bicyclists, and transit vehicles. Such a zone could help to achieve efficiency gains projected for pure C/AV vehicle fleets. Since these vehicles have identification and communications technologies embedded, Seattle would have many options for licensing their entry into a particular area, from traditional electronic toll collection methods to mobile apps. Given that C/AV is cutting-edge technology, this approach has not yet been implemented.

Figure 5. Example of a Waymo autonomous vehicle

Applicability to Seattle

The limits of a C/AV zone could be very similar to a cordon pricing zone, although the zone size would likely be relatively small since limiting access to C/AV would likely cause major traffic diversion around the zone's boundary until C/AVs are widely used.

Pros

In the near term, a C/AV zone could help Seattle eliminate most vehicles in an area without having a "ban" on all vehicles. Simultaneously, commuters could be incentivized to use C/AVs and automakers would be incentivized to promote them, accelerating the value of the zone. Revenues from licensing access to a C/AV zone could support other commuter and equity-focused programs.

Cons

Lack of a significant C/AV vehicle fleet in the region could create a major traffic disruption for many years, as C/AV technology and regulations are still in their infancy. Therefore, this approach would need to be paired with a cordon or area pricing approach until the region has enough C/AVs. Depending on the ownership structure of C/AVs—such as more private ownership of vehicles rather than shared fleets—transportation inequalities could be exacerbated if C/AVs are too expensive for many to afford. As with cordon and area pricing, there would be enforcement infrastructure and operations costs, which would not likely be covered by revenues from a C/AV-only zone in the near term.

Fossil Fuel Free Zone (FFFZ)

Similar to the C/AV concept, a FFFZ would allow only clean-air vehicles not powered by gasoline or diesel, such as electric and hydrogen-fuel vehicles, to enter a zone otherwise limited to pedestrians, cyclists, and transit riders. Many regions in the United States provide special access for clean-air vehicles to use HOV and express lanes, but an FFFZ takes the concept further by restricting access to all but these vehicles within specific geographies or urban areas. Milan's Area C program charges all vehicles for entering the central area and bans the most polluting vehicles altogether.

Figure 6. **Map of Milan's emissions**-based pricing area

Applicability to Seattle

The limits of an FFFZ could be very similar to a cordon pricing zone, although the zone size would likely be smaller since limiting access only to electric and hydrogen

vehicles would cause major traffic diversion around the zone's boundary in the near term. An extensive electric charging and hydrogen fueling station network would be required within the zone to support the restricted vehicle types.

Pros

Similar to the C/AV zone, an FFFZ could provide Seattle an opportunity to restrict most vehicles from an area without completely eliminating the opportunity to drive into the zone. Simultaneously, drivers would be incentivized to adopt clean air vehicles and automakers to promote them, therefore accelerating emission reduction benefits. Implementing an FFFZ would help fulfill the City of Seattle's 2017 commitment to Fossil-Fuel-Free Streets by 2030. Revenues from licensing access to an FFFZ could support other commuter and equity-focused programs.

Cons

Given the limited existing fleet of all-electric and hydrogen powered vehicles in the region, an FFFZ could create significant traffic disruptions for a number of years. Therefore, this approach would need to be paired with a cordon or area pricing approach until the region has a significant number of clean-air vehicles. Transportation inequalities could be exacerbated given the current high cost of purchasing all-electric and hydrogen vehicles. As with cordon and area pricing, there would be enforcement infrastructure and operations costs, which may not be covered by FFFZ revenues in the near term. Charging and refueling infrastructure needed to encourage clean-air vehicles could also add costs.

License Plate-Based Restriction Zone (LPRZ)

To limit the number of vehicles that enter a specific area, License Plate-Based Restriction Zones allow only vehicles with certain license plate numbers into the zone on certain days and/or times. The approach to restrictions can range from something as simple as allowing odd or even plates on certain days to more elaborate approaches that allow ranges of numbers on certain days of the week and or times of day. Similar to cordon, area, and tolling pricing programs, LPRZs can be enforced with tolling technology and/or on-road police enforcement. Many LPRZ programs internationally were originally implemented to improve air quality and are now also used for congestion relief. Mexico City and many other Latin American cities have used this approach since the 1980s and 1990s. Some international cities, such as Beijing and Paris, have implemented temporary restrictions on severe air-pollution days.

Figure 7. Sign indicating vehicle restrictions based on license plate number on certain days and times in San José, Costa Rica

Applicability to Seattle

The limits of an LPRZ could be very similar to a cordon pricing zone. Particular attention would be required to potential traffic diversions near zone boundaries.

Pros

Restricting access to a large number of vehicles could reduce congestion significantly by incentivizing travelers to use other modes. If paired with an area or cordon pricing scheme, revenues can be used to support other commuter and equity-focused programs.

Cons

Transportation inequalities could increase if wealthier households with multiple vehicles have more opportunity to adapt to license plate restrictions. If an LPRZ approach is not paired with a cordon or area pricing program to provide a revenue stream, budget to support enforcement, alternative transportation choices, and commuter-offset programs would need to be identified.

Road User Charges (RUC)

Road User Charges, also known as a Mileage-Based User Fee or Vehicle Mileage Traveled Fee, is an approach to charging people a fee based on the number of miles their vehicle travels. Government agencies are considering RUC as a potential replacement for the existing consumption-based gas tax, especially as improving gas mileage and the increasing number of electric vehicles continues to reduce gas tax revenues. More sophisticated RUC programs vary mileage fees based on time of day and/or location to reflect congestion. RUC-enabling technologies range from a simple odometer log book and annual checks to more sophisticated in-vehicle GPS devices and mobile apps. Oregon has had a permanent RUC program in place since 2015, and many states, including Washington, are piloting RUC programs.

Figure 8. **Oregon's OreGo** RUC program uses several different technologies to calculate miles traveled

Applicability to Seattle

Since Washington State is proposing RUC as a long-term gas tax replacement, the City of Seattle could be an early adopter of the program and leverage the state's RUC framework to implement an additional congestion charge.

Pros

Implementation of a user fee could make a pricing program more equitable in some respects. For example, electric vehicles are not currently paying fees that match their contribution to congestion and road impacts (as they don't pay the gas tax). Pay-as-you-go programs, such as car insurance and cell phone plans, are not new to consumers, so a RUC program may be easier to explain than other types of congestion pricing. Although current RUC pricing programs are simply fixed per-mile costs, more sophisticated pricing structures could provide the City the flexibility to target congested roads and/or times of day.

Cons

Washington State's timeline for implementing RUC as a gas tax alternative is uncertain and is outside the City of Seattle's control. Because RUC is a state-level financing tool, the city would need to determine its roles and responsibilities in working with the state. Seattle could incur additional implementation and operational costs if it were to add pricing complexities not needed by the state.

Arterial Toll Roads

Tolling urban arterials is similar to tolling a highway. To date, congestion pricing programs have only tolled arterials as part of a cordon or area pricing program, placing tolling equipment at a key location along a road to enforce the cordon. Tolling the length of an arterial is generally considered more complex than tolling a highway because of the numerous access points and intersections and the potential for traffic diversion onto other urban streets. However, existing electronic toll collection technology could support such a concept.

Figure 9. Example of tolling equipment used in Singapore

Applicability to Seattle

An arterial tolling program could be implemented on key north-south corridors through the downtown core to reduce congestion, such as 2nd Avenue and 4th Avenue. A small initial launch could be expand to include a network of roads, such as Mercer Street, Elliott and Western Avenues, and Denny Way.

Pros

Tolling arterial roads targets congestion on specific roads and helps to expedite the movement of through vehicle traffic. Such a program could generate revenues to offset implementation and operating costs and fund other city priorities. Tolls could vary by vehicle occupancy, vehicle type, emissions, or by time of day or congestion level, which would allow the City to achieve multiple goals.

Cons

Tolling arterial roads is a very complex concept that may have significant barriers to implementation, including jurisdiction over arterials, coordination with state-level stakeholders, and potential traffic diversion to other Seattle streets. Since arterial tolling has not been implemented elsewhere, combining a technically feasible solution that enforces tolls along a corridor and reduces congestion on and around that arterial would be expensive and time consuming. The capital costs, including both infrastructure and tolling equipment, would be high for this approach.

Arterial Express Lanes

Restricted access in arterial lanes is relatively common in the form of bus-only lanes, such as those on 15th Avenue in Seattle. Like express lanes on freeways, arterial express lanes could also restrict access to those who meet vehicle and occupancy eligibility requirements or to those paying a toll. The state of Florida considered this concept to pay for new arterial lanes but did not implement it. Tampa, Florida has conducted a proof of concept study of a Bus Toll Lane (BTL)—a partnership between transit and toll agencies with shared funding and a revenue-sharing model—but the focus was on limited access corridors. Tolling equipment, similar to that used on freeway express lanes, would be required for such a program.

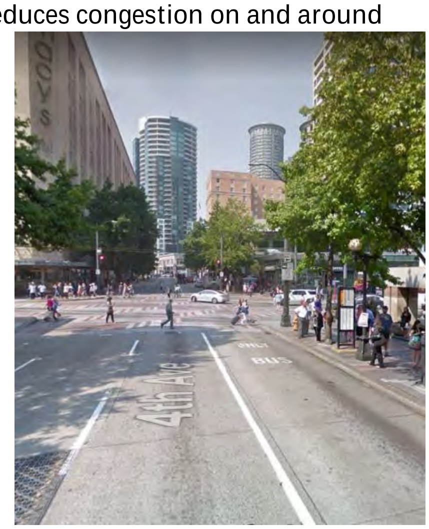


Figure 10. Bus-only lanes, such as this one on 4th Avenue in Seattle, could be considered for inclusion in an arterial express lane program

Applicability to Seattle

Similar to arterial tolling, an arterial express lanes program could target key north-south and east-west corridors. Arterial express lanes could convert and expand current bus-only lanes into dual express lanes, such as on 4th Avenue in downtown Seattle.

Pros

In general, arterial express lanes could have benefits similar to those of tolling entire arterial roads. However, limiting tolling on arterial roads to certain lanes could reduce the costs of implementation as well as traffic diversion.

Cons

Capital costs and limited right-of-way makes building new arterial express lanes cost prohibitive. Implementing arterial express lanes in Seattle would likely require converting existing general-purpose travel lanes to express lanes, which could result in more congestion in the remaining general-purpose lanes. Operational costs associated with enforcing occupancy, toll payment, and access control are significantly more complex than tolling entire roadways.

On-Street Parking Pricing

Variably priced on-street parking can be used to manage demand for parking, which has been shown to reduce congestion. Pricing on-street parking introduces a price signal that encourages some drivers to switch modes and reduces the number of drivers circling to look for parking. A combination of smart meters, embedded parking sensors, and traveler information systems are used to manage parking pricing in near real time. San Francisco is leading the nation in actively managing parking prices, and many other cities, including Seattle, have successfully implemented effective on-street pricing programs.

Figure 11. On-street parking is dynamically priced in San Francisco

Applicability to Seattle

The City of Seattle could expand the current on-street parking pricing program to include a broader area or additional time periods throughout the day, or the City could increase peak-time parking prices.

Pros

Since Seattle already manages on-street parking prices, this approach could leverage existing infrastructure. Pricing on-street parking generates revenue that can offset the cost of this or other congestion pricing programs. In addition, this approach could be combined with other congestion pricing programs to amplify congestion-reduction benefits.

Cons

On-street parking pricing alone is unlikely to have a large impact on transportation mode choice. As with many pricing programs, the ability of on-street parking pricing to change travel behavior depends on communicating the prices prior to a traveler making the choice to drive to the congested area. Thus, the congestion-reduction benefits of such a program are highly dependent on good traveler information systems.

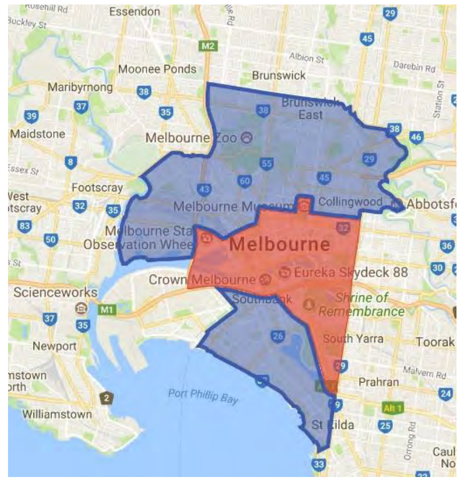


Figure 12. **Example of Melbourne's parking pricing area**

Off-Street Parking Pricing

By pricing off-street parking in public and private lots, many regions are using these fees to influence traveler decisions about driving into certain parts of cities. Cities typically leverage existing sales or property taxes to levy parking surcharges, which are passed on to drivers. Melbourne and San Francisco are case studies for managing off-street parking prices. Seattle has also implemented off-street parking fees.

Applicability to Seattle

The City of Seattle could leverage existing taxation frameworks to apply a parking congestion surcharge. The charge could vary depending on time of day or days of the week to target peak congestion periods. The City could engage parking lot operators to gauge their ability to pass this pricing directly to travelers. The City could also pursue charging fees directly to drivers, but this would require implementation of new parking payment system functionalities and accounting procedures by the City and lot operators.

Pros

By leveraging existing parking payment infrastructure, pricing off-street parking could be a low-cost approach to demand management. The prices could influence regular commuters because they would apply to monthly parkers and other regular drivers. Like on-street parking pricing, this approach could be combined with other congestion pricing programs.

Cons

Demand management depends on responses to pricing signals. The method of charging the parking owner and then passing the charges through to the drivers removes the ability to directly influence driver behavior. If it was possible to charge drivers directly, there could be more implementation, auditing, and operational costs to ensure fees are charged properly.

Technology Requirements and Enablers

If Seattle selects one or more pricing tools for further study and potential implementation, the City will need to consider how the underlying technology supports Seattle's pricing program goals and objectives. The technology will perform two primary functions: accurately and correctly charging travelers; and ensuring that travelers make payments and obey restrictions (i.e., enforcement). To adequately charge and enforce, a pricing system should include the following elements:

- Vehicle identification devices: In addition to using images of vehicle license plates, systems can also use devices attached inside or outside a vehicle, integrated with a vehicle, and/or carried by drivers and passengers to identify vehicles.

- Roadside detectors and enforcement equipment: Most systems use field devices on the roadside or over the roadway to detect vehicles, whether they are paying travelers or scofflaws.
- Back office: Technologies are required to manage customer accounts, process transactions and payments, interface with other external systems (e.g., Department of Motor Vehicles), conduct audits and financial reconciliations, set prices, and monitor performance.

When considering a technology system to support a preferred pricing program, Seattle should assess the following:

1. *Technology maturity* – Deploying existing technologies will likely be less expensive to implement and reduce scheduling risks compared to deploying emerging or in-development technologies. However, existing technologies carry the risk of the technology becoming obsolete in the near future or vulnerable to future market disruptors. Additionally, the City should avoid proprietary technologies to reduce the risk of high costs from a sole source procurement.
2. *Physical footprint of infrastructure* – Since space and urban aesthetics will constrain equipment placement, system performance, and public acceptance, Seattle should include these factors in its technology system evaluation. For instance, a typical tolling system requires overhead mounted antennas to effectively read transponders, which may be visually intrusive. Some technologies also require intensive high-bandwidth communications, which would require construction of communications infrastructure such as conduit banks and telecommunications hubs. However, some technologies can disseminate pricing and congestion information, potentially eliminating other electronic road signs.
3. *Cost* – Seattle should consider both the upfront capital cost of implementation and ongoing operational costs to evaluate the lifecycle costs for various pricing approaches.
4. *Market penetration and interoperability* – Widespread adoption of technologies in the region and by travelers, such as Washington State Department of Transportation's (WSDOT) *Good to Go!* toll transponders and video tolling, could reduce costs and increase customer convenience. Other possibilities include interoperability with the Road User Charge program being examined by the Washington Transportation Commission, private payment systems (e.g., ride-hailing app platforms like Uber and Lyft), and accounts used for other transportation modes, like the ORCA card.
5. *Scalability and flexibility* – The City should also consider the ability of the technology to support sophisticated business rules, such as charging or applying discounts by vehicle class, time of day, and/or location. Any selected technology should have the ability to scale up from a pilot program to a region-wide system.

Technologies and approaches for pricing tools described in the previous section can be broadly categorized into three groups based on their similarities: toll-like, parking, and road user charge. The next section discuss potential technologies for these three groups of pricing programs.

Tolling Technologies

Applies to: Cordon Pricing, Area Pricing, Fleet Pricing, Arterial Toll Roads, Arterial Express Lanes, Connected/Autonomous Vehicle Zone, Fossil Free Fuel Zone, and License Plate-Based Restriction Zone

A number of the pricing tools can leverage technologies traditionally used for tolling because they share the concept of identifying a vehicle at a particular location to apply the appropriate price or enforcement consequence. Area and cordon pricing involve checking for vehicles entering and/or exiting an area; therefore, tolling equipment is placed on the edges of a pricing area or strategically distributed within a pricing area. Pricing tools based on charging specific vehicle types (i.e., C/AV or fleet pricing) and/or

restricting access to certain vehicle types (i.e., FFFZ, LPRRZ) can also use toll equipment to categorize vehicles within a zone or on the borders of a zones.

Since the introduction of electronic tolling in the 1980s, the tolling industry has made progressive advancements in Automatic Vehicle Identification (AVI) and Automatic License Plate Reader (ALPR) technologies, which identify vehicles without impeding traffic flow. Typically, AVI antennas mounted over roadways read transponders in vehicles to identify those with pre-paid toll accounts. ALPR cameras mounted overhead capture images of vehicle license plates to identify those without a transponder. The system can use the images to match a vehicle to a pre-paid account, send its owner a notice of penalty, or send post-paid invoices.

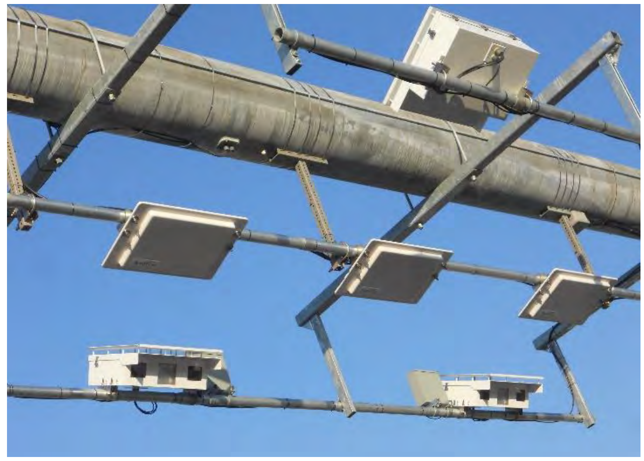


Figure 13. Example of AVI antennas to read transponders and cameras to capture license plates

Alternatively, several emerging technologies may augment and eventually replace these current AVI and ALPR technologies:

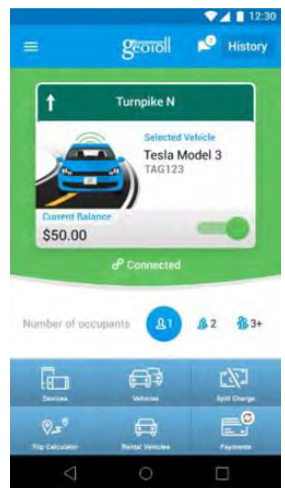


Figure 14. Cell phone apps like GeoToll can create virtual pricing boundaries

- *Cell phone apps* – Several companies are using cell phone-based technologies, such as apps, to determine vehicle location and collect tolls. The app sends the toll and the associated license plates number to the toll facility operator to reconcile with license plates captured by toll operators. Some firms also use Bluetooth-based technologies connected to their app to help identify the number of carpoolers for discounts and for occupancy enforcement. Although firms are promoting "virtual" toll points, toll operators will still need ALPR on the roadside to enforce payment from travelers without apps. Some mobile apps can also pair with devices connected to vehicle On-Board Diagnostic (OBD)-II ports to get more accurate vehicle information and mileage. Cell phone apps can also provide travelers with pricing information and reduce the need for electronic signs.
- *Dedicated Short Range Communications (DSRC)* – The National Highway Traffic Safety Administration (NHTSA) proposes to federally mandate that vehicles manufactured after 2023 have built-in vehicle communications devices to "talk" to other vehicles and roadside equipment. DSRC could allow vehicles to communicate their locations and use on-board sensors to indicate the number of vehicle occupants. DSRC could change the need for travelers to obtain transponders. However, roadside equipment to support DSRC and ALPR cameras to enforce payment by vehicles without DSRC likely will still be needed. If the NHTSA rulemaking for DSRC requirements passes, this technology could be very useful to support a C/AV Zone pricing concept. DSRC can also help vehicles receive and display pricing information to travelers and reduce the need for electronic pricing signs in the field.

- *5G LTE Wireless* – Like mobile phones, vehicle manufacturers are starting to build cellular communications capabilities into their vehicles. This technology could enable vehicles to transmit location information to self-identify and/or pay when they enter into a pricing zone or tolled roadway. Similar to DSRC, roadside equipment and ALPR cameras likely would be needed to enforce and/or charge vehicles without 5G wireless communications. Wide adoption of 5G-enabled vehicles could boost support for a potential C/AV Zone pricing concept. Similar to DSRC, 5G-equipped vehicles could receive and display pricing to travelers, thereby reducing the need for electronic pricing signs in the field.

Figure 15. Connected vehicles with DSRC or 5G LTE could enable pricing

- *Mobile License Plate Readers Improvement* – As video camera and automatic character recognition processing improve and prices are lowered, enforcement of payment and vehicle restrictions based on license plate captures could support distributed deployment of mobile ALPR. Instead of implementing tolling equipment at fixed locations, mobile ALPR systems can be mounted on roving vehicles and/or portable stations. For example, San Francisco Municipal Transportation Agency (Muni) currently mounts mobile ALPR on some transit buses to enforce illegal bus lane parking violations. The Georgia Department of Public Safety mounts mobile ALPR on police vehicles to identify potential carpool scofflaws on the I-85 Express Lanes in Atlanta. With mobile ALPR, Internet of Things (IOT) communications, and computing advancements, costly fixed-location infrastructure could be avoided. Another option that could be considered—albeit with privacy considerations as well—is the ability to leverage multiple sourcing of public video feeds for pricing enforcement.

Figure 16. Mobile License Plate Readers are compact portable systems to aid in pricing enforcement

- *Automated Vehicle Occupancy Detection (AVOD)* – For pricing programs such as express toll lanes with carpool discount rates, verification and enforcement of the number of occupants in vehicles has been challenging due to the need for police enforcement, limited field coverage, and the cost of enforcement. However, in recent years, multiple vendors have deployed camera vision systems to automatically identify vehicle occupants with greater confidence.
- *Autonomous Enforcement Drones* – With advancements in autonomous ground vehicle- and aerial drone- capabilities, acceptability, reliability, and costs, potential new concepts for checking transponders, vehicle types, and license plates could become more practical and cost effective than fixed tolling equipment installations.

Although Seattle could purchase one of the many back office suites that system integrators sell to process payments, handle customer accounts, and issue invoices and violations for tolling and pricing schemes, the City could also leverage one of several back offices already established in the Puget Sound region. For example, WSDOT has a back office system to support its *Good to Go!* tolling program with over 763,000 customer accounts handling over 50 million toll transactions annually. Seattle could also consider leveraging the ORCA card transit payment system, which supports over 1 million cards and approximately 450,000 daily transactions. Although the ORCA system does not currently support tolling, this could be a good option for a pricing program with multimodal incentives.

Another alternative would be to work with a private Mobility as a Service (MaaS) provider, such as Lyft or other ride-hailing firms. These platforms are moving toward allowing travelers to have a single account that handles payments for various transportation modes, such as car sharing, bike sharing, transit, and ride-hailing services. A MaaS platform could handle congestion pricing as another service charge and enable multimodal incentives.

Figure 17. Example of the Swedish MaaS combined mobility program app

Whether operated by the City of Seattle, another public agency, or a private third party, there are many advancements that can make back office systems more customer friendly. Website interfaces, apps, and artificial intelligence-powered Interactive Voice Recognition are technologies that supplement more traditional staffed customer service centers. More advanced back office systems allow payment methods beyond credit cards or bank accounts, which helps to meet the needs of unbanked customers. For example, there are payment networks that use kiosks located in grocery and convenience stores to make it easier for people to pay their chargers with cash and/or their mobile phones.

To address privacy concerns, back office systems can isolate payments and accounts from traveler location information. For example, Oregon Department of Transportation's (ODOT) OreGo road user charge program isolates traveler trip information with third party vendors, and only charged amounts are reconciled with ODOT's financial system. Additionally, some toll agencies, such as the Georgia State Road and Tollway Authority, have developed accounts that only need license plate information, bypassing the need for driver information or other identifiers.

Parking Technologies

Applies to: On-Street Parking and Off-Street Parking

Parking technologies have progressed dramatically with the introduction of electronic payment systems. Advancements in vehicle detection, payment methods, traveler information, and enforcement have improved the customer experience and operations for both on-street and off-street parking.

For on-street parking, the City is already using pay stations and a mobile payment app (Park Mobile) to make it easier for customers to pay for and track their parking use. Both of these electronic payment methods could help the City support an additional parking price for congestion reduction, although some older pay stations may need to be replaced to implement dynamic pricing. There are also other parking technologies the City could use to enable more dynamic parking pricing:


Figure 18. Siemens radar sensors can monitor parking spaces

- *Parking space detectors* – Embedded pavement sensors, video cameras, and radar detector technologies can help monitor on-street parking availability. These types of technologies could allow the City to set parking prices more dynamically and to communicate available parking spaces to reduce traffic caused by circling vehicles looking for parking.
- *DSRC* – As mentioned above, the Federal Government may mandate that vehicles built after 2023 have 5.9 GHz networking capability, which could provide another tool for monitoring parking availability. With built-in vehicle communications, the City and other DSRC-equipped vehicles could broadcast parking space and pricing information to vehicle navigation systems in real time. The City could also allow parking payments through DSRC once a vehicle is parked.
- *Autonomous vehicles* – Like DSRC, the ability for autonomous vehicles to communicate enables parking space detection, dissemination of pricing information, and parking payments. A potential future scenario might be for a traveler to select a destination and their willingness to pay for on-street parking; once the choices were made, the autonomous vehicle would do the rest. AVs could contribute to traffic congestion if they were to calculate the price of parking and decide not to park and instead continue circling.
- *Mobile license plate readers* – Instead of the City's current in-vehicle stickers, parking enforcement could be improved by using license plate-based parking, where drivers link parking payments to their vehicle license plates. With mobile license plate readers system, video cameras mounted on enforcement vehicles can automatically detect and alert parking staff to violators. This approach could increase parking enforcement efficiency, particularly if dynamic parking pricing is introduced.
- *Parking information dissemination and analytics* – Although the City currently disseminates parking information through its web-based parking map, more private sector involvement in on-street parking could improve travelers' decision making and reduce the need for parking pricing signs. Several parking information service providers, such as TomTom, provide both parking information and predictive parking availability information. The City should continue to engage the private sector on ways to share parking pricing and availability data.

For off-street parking, the electronic payment technologies market varies tremendously to reflect the wide range of parking business cases. For instance, a private gated parking garage leverages different parking technologies tied into a building security system then a non-gated public parking surface lot. Additionally, parking payment business rules vary since customers can pay for off-street parking in different ways, even in the same parking lot. For example, some people have their parking pre-paid by their employers monthly, whereas infrequent drivers might pay for their hourly parking upon exit. The many types of parking systems reflect this variance in off-street parking, which makes standardization of system interfaces and data exchange challenging.

Despite the lack of standardization, advancement in electronic parking payments can make off-street parking a more effective pricing tool. Electronic payment technologies that continue to advance include the following:

- *Point of sale system upgrades* – Many parking garages use point of sale systems and can handle added fees and taxes, so it could be possible to add a congestion surcharge. Close coordination with parking operators and vendors is needed to assess any potential pricing program, frequency of pricing changes, and communication.
- *Mobile payment applications* - Some cash-based parking facility operators may need assistance transitioning their customers to an electronic payment system and changing their pricing. A simpler electronic implementation approach could use a parking mobile app offered by companies such as ParkMobile, PayByPhone, and QuickPay, which operate off-street parking payment systems in the Puget Sound region. Similar to tolling, parking facilities could charge a higher price when customers pay with cash instead of electronically. Many cash facilities have an operational incentive to transition away from cash payment to reduce labor costs of processing cash and revenue leakage from cash handling.
- *6C Protocol Transponders* – WSDOT's *Good To Go!* tolling system uses transponders with the 6C communications protocol, and these same transponders can be used for parking garage access. For example, the toll operator E-470 in Denver partners with the Denver International Airport for parking payment and access using the ExpressToll transponders. The use of the 6C protocol in transponders is increasingly prevalent—for tolling, fleet vehicle management, and in-vehicle payment methods—because these transponders are inexpensive, allowing for wider distribution and adoption. If the City were to implement multiple pricing tools, 6C transponders could be used for both a cordon pricing and an off-street parking program, for example.

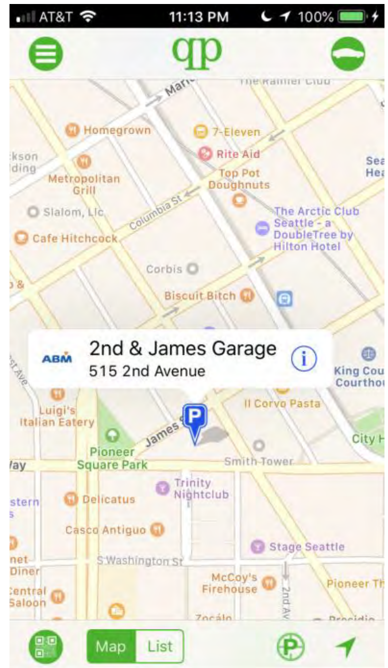


Figure 19. QuickPay app enables travelers to pay for off-street parking

- *DSRC and autonomous vehicles* – As with on-street parking, a vehicle with the capability to communicate and/or navigate could help people make better decisions on parking options and help parking lot operations run more efficiently. For example, a DSRC vehicle linked to a payment account could be processed by a gated parking system, thereby reducing bottlenecks at garage exits and reducing the need for parking attendants.
- *Parking information dissemination and analytics* – For parking pricing to affect a person's decision to drive or use another transportation mode, the price must be effectively communicated and transparent.

Road User Charge

Applies to: Road User Charging

Although tolling and RUC share many similarities, RUC is based on charging by the total distance traveled. Therefore, deploying current tolling technology based on AVI and ALPR on every roadway would be impractical and prohibitively expensive to build and operate. However, some of the future alternative technologies discussed in the tolling section could be applied to RUC. Cell phone apps, DSRC, 5G LTE,

and autonomous vehicles are technologies that can track vehicle distance traveled. But more importantly, these technologies could help to identify when and where vehicles travel on charged (or tolled) roadways. In terms of back office technologies, RUC and tolling are very similar—they must support customer accounts and process charges—and would use similar technologies.

Privacy Considerations

Privacy is one of the chief concerns raised whenever discussing congestion pricing, whether it is tolling, road user charging, or parking.[1] Inherently, congestion pricing requires identifying a customer at a particular time and place in order to properly charge them. This introduces two primary concerns related to "Personally Identifiable Information (PII):"

- Location Tracking: knowing where a customer has been
- Personal Customer Information: details that can uniquely identify a person, such as name, address, or financial information

Models for protecting PII are already established in the larger electronic payments space, which includes tolling and transit fare cards. In particular, hundreds of toll facilities in the U.S. that use electronic toll collections have developed business practices to deal with PII regulations, which could be transferable to a broader set of congestion pricing projects. For example, WSDOT's *Good to Go!* Program has technologies and procedures in place to safeguard PII information, such as using proprietary internal identifiers, encryption, and anonymizing or aggregating travel data.

In addition, since toll operators handle credit card information, they are subject to the credit card industry's stringent security standards called Payment Card Industry Data Security Standards. Some toll operators also offer cash-based accounts that do not require customer information, further ensuring anonymity. Many toll operators also proactively educate customers on privacy issues and disclose privacy terms on customer agreements, websites, and other media. These tolling industry practices are well established and tested in court; therefore, they offer a practical roadmap for application to other types of congestion pricing tools.

Any potential pricing program in Seattle would be required to comply with the City's Surveillance Ordinance 125376, which "is designed to provide greater transparency to City Council and the public when the City acquires technology that meets the City's definition of surveillance."[2] The ordinance requires that City Council review and vote on the acquisition and use of any surveillance technologies and also stipulates community involvement and analysis of potential privacy implications, especially relating to equity and community impact.

Piloting Pricing

When considering a new technology or operational strategy, private companies and public agencies may choose to pilot the program to reduce the economic and political risk of making a significant investment.

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[1] Washington State has several RCWs addressing customer privacy. The Washington Public Records Act (RCW 42.56) broadly addresses protecting public records. Specific tolling regulations cover tolling PII (RCW 42.56.330) and tolling enforcement (RCW 46.63.160).

[2] City of Seattle Surveillance Ordinance 125376: https://www.seattle.gov/tech/initiatives/privacy/surveillance-technologies/about-surveillance-ordinance

A pilot can reduce many different types of risk, but the two main sources of risk are generally the following:

- Technological – Does the technology supporting the program actually work? For example, does a vehicle occupancy detection technology accurately determine the number of passengers in a vehicle?
- Program – Do travelers actually respond to the program in the intended fashion? For example, does increasing parking prices discourage people from driving?

In order for a pilot to reduce risk, the City (or another entity) must understand what type of risk it wants to reduce and design the pilot accordingly. By its nature, a pilot is a limited test of a concept. Pilot designers can constrain the implementation of a concept by limiting the physical area of the test, limiting the number or types of participants in the pilot, or testing only a portion of the technology. If an entity (such as the City) wants to ensure that the technology works, then piloting in a limited physical space and/or piloting with volunteer participants could be an adequate test of the technology. On the other hand, if the purpose of a pilot is to test traveler response to a pricing tool, then piloting with volunteers or in a small area may skew the results; a pilot focused on a limited technological scope may be a better design in this case. Pilot design may also depend on factors including the budget, schedule, and level of coordination required with other parties, such as integration with other systems.

After accounting for the considerations above, Seattle could conduct a pilot on any of the pricing tools described in this memo, depending on the goals and circumstantial constraints. The list below describes potential pilot approaches for different pricing tools. (All program selections are theoretical for the purpose of exploring potential pilot program designs.)

- *Cordon/area pricing with cell phone app* – In this example, Seattle has required all vehicles travelling within a certain zone to have an app that determines when the vehicle travels into the priced zone. Seattle could conduct a pilot to demonstrate that the app can accurately determine when the vehicle is in the priced area. This pilot would be limited in both geography and in the number of travelers with the app downloaded to their phones. Enforcement could be done with strategically placed mobile license plate readers to identify violators. The priced area could be small to start and then gradually expand beyond the pilot.
- *FFFZ, LPRZ, and C/AV only with police and mobile ALP* – In this pilot, Seattle could combine restrictions to certain vehicle types, license plate numbers, or clean air vehicles to lessen the traffic disruption impacts caused by prohibiting other vehicles. Enforcement could be handled by police and/or strategically placed mobile license plate readers to identify violators. Violation fees could be used to offset operational and program costs. Restrictions to vehicles could start with a small area and focus first on an end license plate number on certain week days. The pilot could then introduce more vehicle type restrictions, prohibit more license plate numbers, and expand the restricted area over time.
- *Vehicle fleet with transponders* – As a proof-of-concept pilot, the City could price an area with heavy vehicle fleets, such as intersections near industrial areas. Then the program could expand to TNCs traveling through congested downtown intersections.
- *Road User Charge* – Seattle could engage the Washington State Transportation Commission to jointly pursue USDOT funding under the Surface Transportation System Funding Alternatives (STSFA) grant program.
- *On-street parking* – Seattle could modify parking systems in downtown to dynamically vary parking rates. The City could also pilot different parking sensor technologies to verify availability of street parking in real time.

- *Off-street parking* – The City could pilot a pricing surcharge in Seattle's ePark program parking garages. The technology that tracks space availability could be used to set parking congestion prices. More importantly, the ePark website enables travelers to see parking prices in real time before starting their trip, instead of relying on a sign board when arriving at their destination. To expand the pilot, the City could engage private lot operators and provide subsidies for system upgrades (funded by the ePark surcharge).

Legal Implications of Pricing Tools

Along with weighing the relative advantages and disadvantages of each pricing tool, the City will need to evaluate pricing tools in the context of federal, state, and local legislation and regulations. These legal considerations can have a significant impact on the difficulty of implementing a particular tool or set of tools. This section takes a high-level look at existing laws and regulations that apply to each tool. As the City narrows the tools under consideration, a more extensive review of preferred tools will be required. The level of regulatory change needed may also depend on Seattle's coordination with other government entities, such as the WSDOT and the Federal Highway Administration. Current laws and regulations related to pricing may affect the City's authority to implement a pricing tool; constrain how the City can implement a pricing tool; and impact enforcement effectiveness.

A review of the Revised Code of Washington (RCW) and Washington Administrative Code (WAC) as well as Seattle's Municipal Code points to laws and regulations that may apply to various pricing approaches. (Appendix A contains links to the material reviewed to inform this section.) A summary of the ways the legal framework for tolling, parking, and vehicle fleet restrictions may impact the various tools is below.

Tolling Vehicles

Applies to: Cordon Pricing, Area Pricing, Fleet Pricing, Road User Charge, Arterial Toll Roads, and Arterial Express Lanes. (May apply to: Connected/Autonomous Vehicle Zone, Fossil Free Fuel Zone, and License Plate-Based Restriction Zone)

For tools that depend on the collection of tolls, RCW 36.03.040 establishes the right of the Seattle Transportation Benefit District (STBD) to charge "vehicle tolls on state routes, city streets or country roads within the boundaries of the district unless otherwise prohibited by law." Further, RCW 36.73.065 states that, "tolls may not be imposed by a district without approval of a majority of the votes in the district voting on a proposition at a general or special election."

Tolling a state route is more complex—RCW 47.56.820 requires that the state legislature must first authorize the tolls on such roads. That same law states that WSDOT and the Washington Transportation Commission may have a role in setting and collecting tolls on any road depending on the proposed toll's impact on state transportation plans; this is formalized in Chapter 468-270 (WAC). Thus, although the STBD has the authority to toll, it would need to coordinate with WSDOT and the Transportation Commission to implement any tool involving tolls. The RCW does not specifically address the authority to impose tolls in the form of area pricing or fleet restrictions, so these tools would require additional legal analysis.

Since any use of pricing to manage congestion depends on vehicles actually paying the assigned fees, enforcement is vital. RCW 46.63.160 allows WSDOT to issue Notices of Civil Penalty to people who do not pay their tolls. The law specifically cites WSDOT's right issue these notices, not any other tolling entity. This suggests that the City of Seattle would either need to work with the state to pass new legislation or coordinate with WSDOT to have all tolls processed through that agency.

Parking Pricing

Applies to: On-Street and Off-Street Parking

Seattle is already exercising its authority under City Ordinance 11.76.015 to charge parking fees on city streets and parking facilities. Municipal Code 11.31.121 lays out penalties that the City may charge for all types of parking infractions, including failure to pay parking fees. If the City were to implement a more complex dynamic pricing structure and charge drivers directly, the ordinances that authorize these parking fees may need to be revised.

Vehicle Fleet/Class Restrictions

Applies to: Connected/Autonomous Vehicles Zone, Fossil Free Fuel Zone, Arterial Express Lanes, and License Plate-Based Restriction Zone

Several of the potential pricing tools would require the City to limit access to certain geographic areas for certain vehicle types. The City of Seattle does have the right, under City Ordinance 11.16.280, to create special zones, such as pedestrian zones and car sharing zones. However, roads under WSDOT's jurisdiction would need laws and regulations to allow such restrictions to be imposed. Using cameras to enforce these zones with automatically-issued tickets, would require legislation similar to City Ordinance 11.50.570 for automated traffic safety cameras. Seattle's legal powers to use cameras for enforcement is subject to restrictions imposed by the Washington State Legislature.

Appendix A

The following are relevant links to statutes and codes for pricing:

1. Transportation Benefit Districts - RCW 36.73.040 - Specific language on tolling city streets
   http://app.leg.wa.gov/RCW/default.aspx?cite=36.73.040
2. Transportation Benefit Districts – RCW 36.73.065 - Election needed to impose a toll
   http://app.leg.wa.gov/RCW/default.aspx?cite=36.73.065
3. State Toll – RCW 47.56 – Tolling of State Highways
   http://app.leg.wa.gov/RCW/default.aspx?cite=47.56
4. Setting toll amount – WAC 468-270 – Setting tolls on toll facilities
   http://apps.leg.wa.gov/wac/default.aspx?cite=468-270
5. Toll enforcement - RCW 46.63.160 – Photo enforcement and civil penalties
   http://app.leg.wa.gov/RCW/default.aspx?cite=46.63.160
6. Parking – Title 11, Part 1, Chapter 11.76 – Parking payments
   https://library.municode.com/wa/seattle/codes/municipal_code?nodeId=TIT11VETR_SUBTITLE_ITRCO_PT7STSTPALO_CH11.76PAPADEOP_11.76.015PAVIBLPOTHREPAPA&showChanges=true
7. Parking enforcement – Title 11, Part 1, Chapter 11.32.280 – Parking enforcement and issuance of violations
   https://library.municode.com/wa/seattle/codes/municipal_code?nodeId=TIT11VETR_SUBTITLE_ITRCO_PT3EN_CH11.32CI_11.32.080RECI&showChanges=true
8. Special Zones – Title 11, Part 1, Chapter 11.16.280 – Creation of special traffic zones
   https://library.municode.com/wa/seattle/codes/municipal_code?nodeId=TIT11VETR_SUBTITLE_ITRCO_PT1GEPRAD_CH11.16TRAD_11.16.280TRENUTPEZO
9. Seattle Surveillance Ordinance 125376 – Requirements related to surveillance technologies
   https://seattle.legistar.com/LegislationDetail.aspx?ID=2981172&GUID=0B2FEFC0-822F-4907-9409-E318537E5330&FullText=1

From: Wieland, Jennifer <jwieland@nelsonnygaard.com>
Sent: Thursday, January 17, 2019 8:24 AM
To: Propst, Roberta; Adkins, Genesee; Helmbrecht, Elliot; Krawczyk, Tracy; Simpson, Kristen
Cc: Helmbrecht, Elliot
Subject: RE: Congestion Pricing follow-up
Attachments: DRAFT Congestion Pricing MO Staff Briefing_20190111.pdf

Here's our working draft for discussion.

Jennifer Wieland
Principal
t 206.576.3938 **m** 206.650.9238
Nelson\Nygaard

-----Original Appointment-----
From: Propst, Roberta <Roberta.Propst@seattle.gov>
Sent: Wednesday, January 16, 2019 10:41 AM
To: Propst, Roberta; Adkins, Genesee; Helmbrecht, Elliot; Krawczyk, Tracy; Simpson, Kristen
Cc: Helmbrecht, Elliot; Wieland, Jennifer
Subject: Congestion Pricing follow-up
When: Thursday, January 17, 2019 8:00 AM-8:50 AM (UTC-08:00) Pacific Time (US & Canada).
Where: (SMT 3854) or Skype Meeting: 206-386-1200, PIN 556433

Per Genesee's request to follow up from Friday's meeting.

....

Join Skype Meeting

Trouble Joining? Try Skype Web App

Join by phone

206-386-1200,,556433# (US) English (United States)
844-386-1200,,556433# (US) English (United States)

Find a local number

Conference ID: 556433
Forgot your dial-in PIN? | Help

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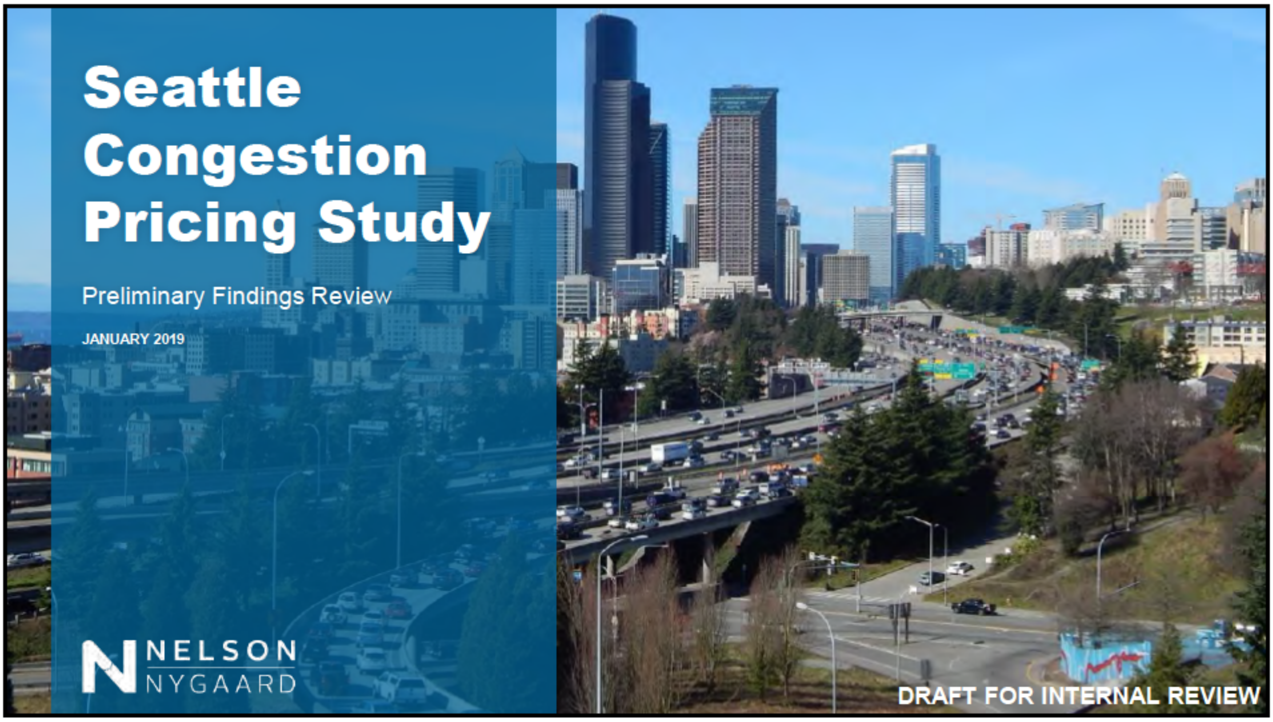
Seattle Congestion Pricing Study
Preliminary Findings Review
JANUARY 2019
NELSON NYGAARD
DRAFT FOR INTERNAL REVIEW


AGENDA
CURRENT STUDY EFFORTS
PEER RESEARCH & LEGAL FRAMEWORK
FINDINGS: PRICING TOOLS
FINDINGS: EQUITY & IMPACTS / BENEFITS
FINDINGS: MESSAGING & OUTREACH
NEXT STEPS
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CURRENT STUDY EFFORTS

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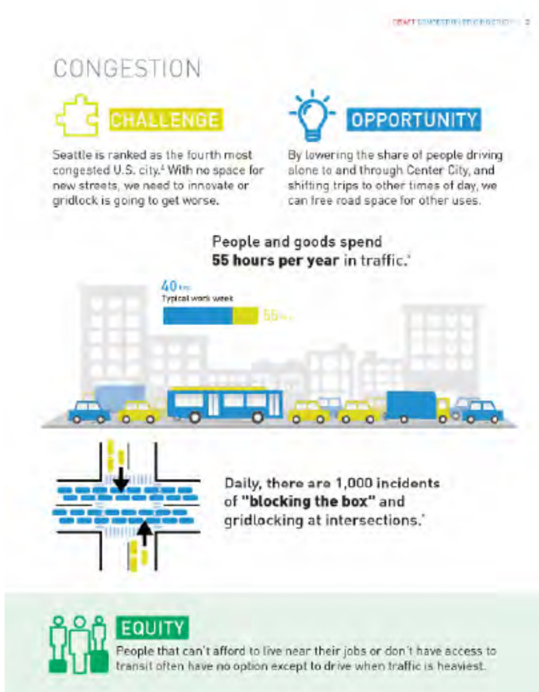
DRAFT WHITE PAPERS

- Pricing Opportunity Statements
- Tools, Technologies, and Legalities
- Screening Potential Pricing Tools
- Best Practices in Communications and Messaging
- Creating a More Equitable Pricing Program
- Preliminary Impacts and Benefits



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LEARNING FROM PEERS

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WHO IS PRICING MOBILITY

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KEY LESSONS

- All cities that have implemented congestion pricing built on aggressive **transportation demand management** programs
- All congestion pricing programs implemented to date have been with the intention to **reduce congestion and/or emissions**
- Most programs have provided a **positive revenue stream** that funds additional transportation options and services
- Public and business **acceptance has risen dramatically** post implementation

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WHO IS PRICING TODAY

Mechanisms in Use

	Stockholm	London	Singapore	Milan	Gothenburg
Mechanism	LEZ – 1996 CC – 2007	CC – 2003 LEZ – 2008	ALS – 1975 ERP – 1998 GPS ERP – 2017	LEZ – 2008 CC – 2012	CC – 2013
Time to Prepare	4 years	3 years for CC	13 years for ERP	2 years for LEZ	9 years

LEZ = Low Emissions Zone

CC = Congestion Charge

ERP = Electronic Road Pricing

GPS ERP = GPS Based Road Pricing

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WHO IS PRICING TODAY

The Results

	Stockholm	London	Singapore	Milan	Gothenburg
Trip Reduction	-22%	-16% all -30% charged	-15% with new technology -44% in 1975	-34%	10%
GHG Benefit	-14% CO_2	-17% CO_2	-15% CO_2	-22% CO_2	2.5% CO_2
Travel Time Results	-33% delays	-30% delays	Managed by price for 45-65 km/h (expressways) 20-30 km/h (other roads)	-30% delays	-10% to 20% travel time in corridors
Net Annual Revenue	$150M	$230M	$100M	$20M	$90M

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WHO MIGHT BE NEXT

North American Cities and Regions Considering Charging

	New York City	San Francisco	Vancouver	Washington State	Portland	Los Angeles
Status	Studies complete, Governor “ready” to implement	Phase 1 study complete; Phase 2 pending	Phase 1 study complete; Phase 2 pending	Pilot program underway	Scoping study	Scoping study
Mechanisms Studied	Cordon ERP Fleet	Cordon ERP	Cordon RUC	RUC	TBD	TBD
Time Underway	20+ years	10+ years	2+ years	1 year	Oregon has voluntary RUC since 2015	Pending

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EXAMPLE: NEW YORK CITY

Phased Approach: 3 Steps to Mobility Pricing

Foundation: *Regulation and Transit Improvements*

For-Hire Vehicle Charge: *Could raise $200M or more*

Zone Pricing: *Could raise ~$800M or more*

FIGURE 12. ESTIMATED ZONE FEE GROSS REVENUE (ASSUMES ONCE PER DAY) (IN $MILLIONS)

	Below 60th Street		
	Mon–Fri 6am–8pm	Mon–Fri 6am–8pm Sat and Sun 12pm–10pm	Variable Pricing – See Rate Tables Below Mon–Sun 24-hours per Day
Revenue: Autos ($11.52 fee)	$705	$905	$970
Revenue: Trucks ($25.34 fee)	$105	$120	$130
Total: Autos/Trucks	$810	$1,025	$1,100
Congestion Reduction (Reduction in CBD entries during specified charging periods)	13%	14%	8%
Average CBD Speed Increase	9%	9%	8%

(Fix NYC)

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EXAMPLE: WASHINGTON STATE

Road Usage Charge Pilot

- Potential gas tax replacement
- ~2,000 drivers participating
- Charge for miles driven
- Variety of reporting options
- Pilot intended to gather data and inform future policy decision

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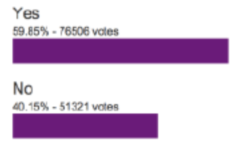
LEGAL AUTHORITY

Our Existing Authority

- State law authorizes Transportation Benefit Districts to establish tolling of local roads with majority voter approval
  - Revenues must be dedicated to specified transportation improvements set out in a TBD's "transportation improvement plan" *(RCW 36.73.067)*
- TBD may set and collect tolls only as authorized by State Transportation Commission "in amounts sufficient to implement the district's transportation improvement plan"
  - Tolls may vary for type of vehicle, time of day, traffic conditions, and/or other factors designed to improve performance of the facility or the transportation network *(RCW 47.56.078)*

Seattle Transportation Benefit District Proposition No. 1 Transportation Funding



Washington State Transportation Commission

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KEY FINDINGS

1. PRICING TOOLS
2. EQUITY IMPACTS & BENEFITS
3. MESSAGING & COMMUNICATIONS

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POTENTIAL PRICING TOOLS

TOOLS EXPLORED

Comprehensive Scan

- Cordon pricing
- Area pricing
- Fleet / vehicle class pricing
- Road user charge
- License plate-based restriction zone
- On-street parking pricing
- Off-street parking pricing
- Arterial toll roads
- Arterial express lanes
- Connected / AV zone
- Fossil fuel free zone

PRICING TECHNOLOGY

Tools to Charge and Enforce

- Pricing systems must include:
  - Vehicle ID devices
  - Roadside detectors and enforcement equipment
  - Back office
- Technology considerations include:
  - Maturity
  - Infrastructure footprint
  - Cost
  - Market penetration and interoperability
  - Scalability and flexibility

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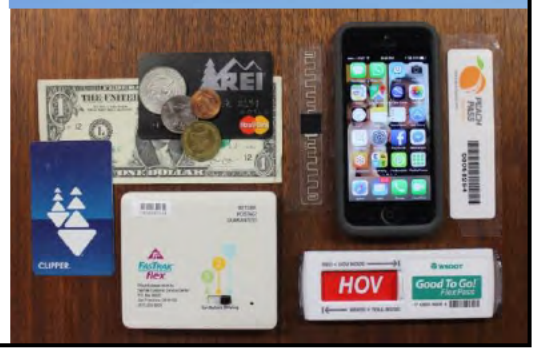

SCREENING METHOD

Narrowing Potential Tools

- **Equity**
  - Cost burden
  - Revenue potential
- **Climate and Health**
  - Climate-friendliness
  - Health benefits
- **Congestion**
  - Within Seattle
  - Through Seattle
- **Implementation**
  - Ease
  - Cost

Six Key Steps in Pricing
1. Identify Who, What, and Where
2. Why? Define Equity Outcomes and Performance Indicators
3. Determine Benefits and Burdens
4. Devise Programs to Advance Transportation Equity
5. Provide Accountable Feedback and Evaluation
6. Expect and Plan for Project Changes

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CORDON PRICING

Inter-Zone Travel

- Likely to reduce trips *into* Center City
- Relatively simple to explain
- Less infrastructure than area pricing
- May exclude people from high-demand areas
- Additional transit service could mitigate impacts for lower-income travelers

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AREA PRICING

Intra- and Inter-Zone Travel

- Captures intra-zonal travel (meaning more trips and more equitable impacts)
- Encourages both *fewer* and *shorter* trips
- Requires more infrastructure than cordon pricing
- Could generate more revenue than cordon pricing
- May exclude people from high-demand areas
- Additional transit service could mitigate impacts

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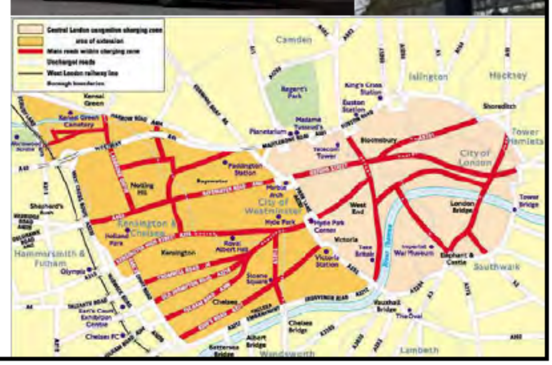

FLEET PRICING

Targeted Approach

- Can target specific vehicle types (beyond TNCs)
- Congestion reduction and revenue generation potential may be more limited
- Ease of implementation, as many fleet vehicles are permitted/registered
- Mitigation could be more streamlined (although the types of vehicles to be charged must be carefully considered)

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ROAD USER CHARGE

Vehicle Miles Traveled (VMT)

- Most directly tied to road use
- High potential for congestion reduction
- Relatively easy to tailor to achieve specific outcomes (and avoid impacting certain populations)
- Opportunity to partner with state pilot program
- Difficult to enforce

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FEEDBACK AND NEXT STEPS

Confirm Direction

- Should the team further refine one or more of these tools?
- What options should be considered?
  - Geography
  - Time of day
  - Vehicle types

[redacted]

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INITIAL EQUITY IMPACTS & BENEFITS

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ACKNOWLEDGE INEQUALITIES

- Our current system isn't equitable
- Pricing can be a way to improve rather than worsen the system
- Key is full understanding of impacts and tailored solutions

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PAYING FOR TRANSPORTATION

Percent of Income Allocated to Various Taxes across Household Income Cohorts in Seattle, 2016

Source: Economic Opportunity Institute, Who Really Pays: An Analysis of the Tax Structures in 15 Cities Throughout Washington State

City of Seattle

- Seattle DOT
- Variety of local funding sources including local taxes, fees, bonds, and general fund appropriations

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PURPOSE OF PRELIMINARY ANALYSIS

Who Will be Affected

- Use existing data
- Evaluate likely impacts of select pricing options on different groups
- Focus on equity
- Acknowledge what cannot yet be known

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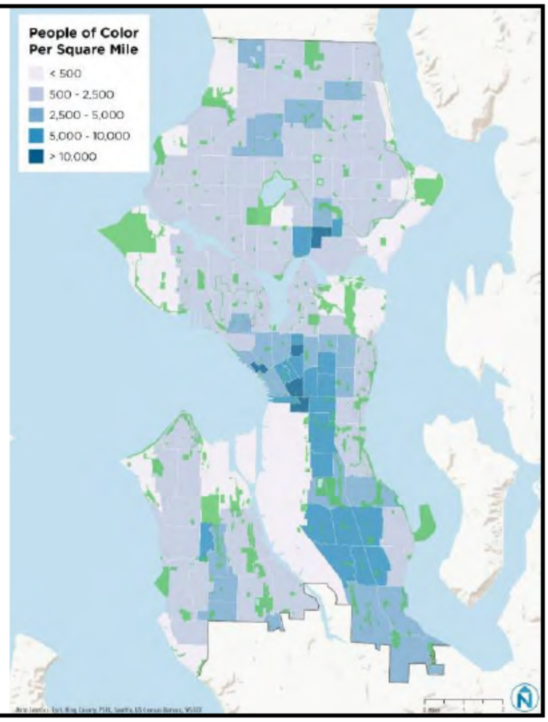

AREA PRICING: AUTO TRIPS

Who is Affected

- Priced zones = downtown neighborhoods
- Data source = PSRC 2017 trip diary data (~500 trips)
- [redacted]
- Vehicle types included:
  - Household vehicle
  - Rental car
  - Carshare
  - Vanpool
  - Other non-household vehicle
  - Car from work
  - Friend/colleague's car
  - Taxi
  - Other hired service (e.g., Lyft, Uber)

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AFFECTED COMMUNITIES: AUTO TRIPS

[redacted]

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AFFECTED COMMUNITIES: AUTO TRIPS

[redacted]

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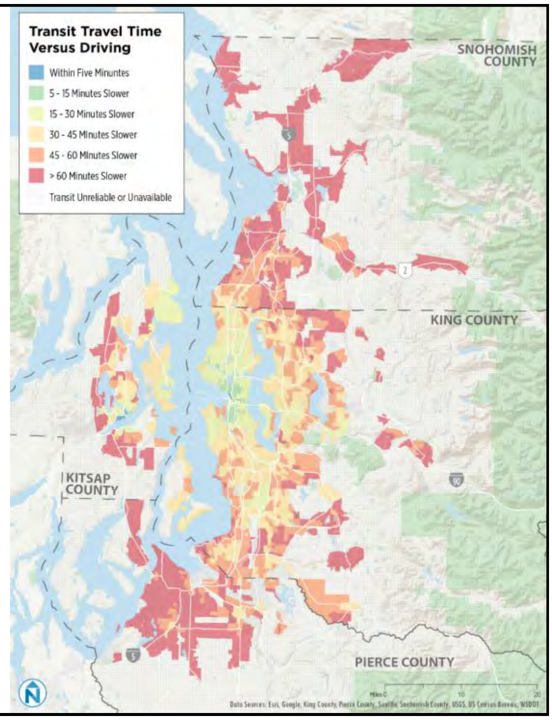
AREA PRICING: TRANSIT TRIPS

Who is Affected

- KCM, Sound Transit, Community Transit trips
- PM peak hour = 4:30-5:30 p.m.
- Assumed 15% travel time savings from today
- Average vehicle load = 48 people



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TRANSIT TRIPS

Time Saved with Area Pricing

55 SERVICE HOURS are gained **PER DAY** →

That's like getting a **BONUS TRANSIT ROUTE** for free

Each commuter saves **6 MINUTES** on the bus **EVERYDAY** →

That's like getting **1 EXTRA DAY** each year for **EVERY COMMUTER**

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AFFECTED COMMUNITIES: TRANSIT RIDERS

Who Will Benefit

Age	KCM Riders	King County
55+	38%	25%
35-54	34%	29%
18-34	25%	26%
16-17	3%	21%
0-16	n/a	

Home Location	KCM Riders	King County
Seattle / N. King County	64%	34%
South King County	19%	38%
East King County	17%	28%

Source: KCM 2016 Rider Survey Report

Vehicle Access	KCM Riders	King County
Vehicle for personal use	93%	n/a
Household owns vehicle	76%	90%

Ethnicity	KCM Riders	King County
White	69%	67%
Asian or Pacific Islander	17%	17%
Black or African American	5%	6%
Hispanic	5%	9%
Other	2%	7%

Annual Income	KCM Riders	King County
<$35,000	25%	22%
$35,000 - $100,000	34%	39%
>$100,000	32%	39%

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AREA PRICING: VMT AND GHG REDUCTIONS

Congestion and Climate Benefits

Congestion Pricing Approach	Change in VMT		Change in Road GHG Emissions	
	From Baseline	From 2035 Control (Low – High)	From All Seattle 2014 Baseline	From All Seattle 2035 Control (Low – High)
Area Pricing: Center City	-14.3% – -23.1%	-22.0% – -30.0%	-6.1% – -9.9%	-9.8% – -13.3%

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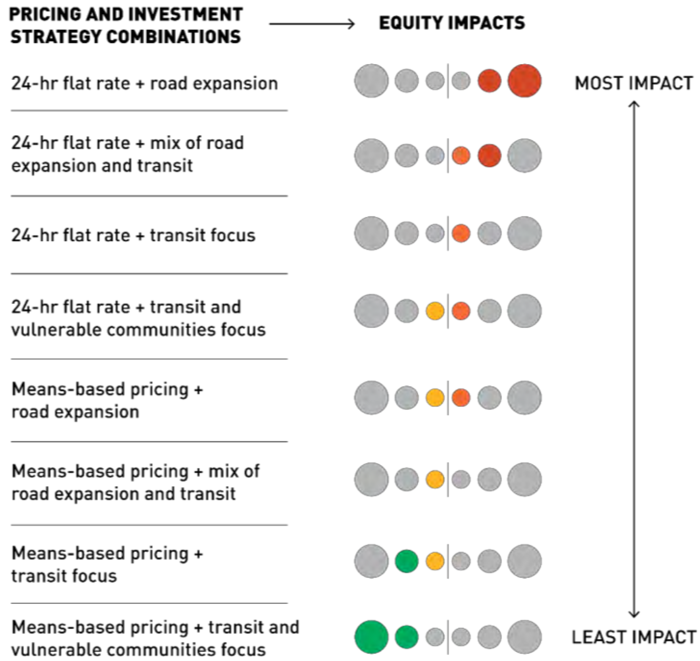
EQUITY: SOLUTIONS FOCUS

- More equitable outcomes are possible by adjusting the pricing and/or investment strategy



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BUILDING AN EQUITABLE PROGRAM

A Full Equity Strategy

- Go beyond a toolkit
- Connect analysis to recommendations
- Design program to address barriers
- Inform expenditure framework
- Develop supportive programs
- Establish pre- and post-deployment monitoring

A Framework for Equity Outcomes in New Mobility

With new technologies and services emerging by the month, cities and governing bodies will need a framework for evaluating equity impacts. The framework below is a starting place that can be tailored to meet the needs of communities.

INCREASED ACCESS TO OPPORTUNITY
- Does it overcome barriers (financial, cultural, technological, geographic) to accessing new mobility, so vulnerable populations actually benefit?
- Does it improve, not impede, the movement of public transit?
- Does it increase access to jobs, education, health care, and other destinations?
- Does it reduce travel times for low-income households?
- Does it prioritize the needs and trip patterns of vulnerable populations?

AFFORDABLE OPTIONS
- Is the price low enough for low-income individuals to regularly use the service?
- In instances where existing services such as bus lines are being cut, are there mechanisms to ensure that transportation costs don't increase for low-income households?
- Is it likely to reduce transportation costs in the long run (e.g. by reducing the need for vehicle ownership or for parking in new developments)?

MORE HEALTHY & SAFE COMMUNITIES
- Does it reduce air pollution and greenhouse gas emissions, both of which disproportionately burden low-income communities and people of color?
- Does it serve people with disabilities, or people who walk or bike?
- Are there policies in place to prevent discrimination or racially-biased policing?
- Is it likely to improve health and reduce health disparities for vulnerable populations (e.g. by reducing crashes and fatalities or focusing vehicle electrification in impacted communities)?

REDUCED INCOME INEQUALITY & UNDEREMPLOYMENT
- Does it increase employment with stable, well-paying jobs?
- Does it create pathways for low-income individuals to enter the new mobility work force?
- Are there policies in place to ensure fair treatment of the labor force (e.g. providing a living wage, ability to unionize, benefits, etc.)?[9]
- Are we creating programs to train workers and replace jobs that will be lost with vehicle automation?

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FEEDBACK AND NEXT STEPS

Additional Analysis Needs

- What additional research and analysis is needed at this time?
- How do we want to engage community partners in shaping a more equitable pricing program?

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MESSAGING & OUTREACH

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MESSAGING BEST PRACTICES

A Delicate Balance

- Most initiate with strong consensus around need to manage congestion
- Most have significant public consultation process
- Consistent experience is that public support is lowest pre-implementation and increases soon after

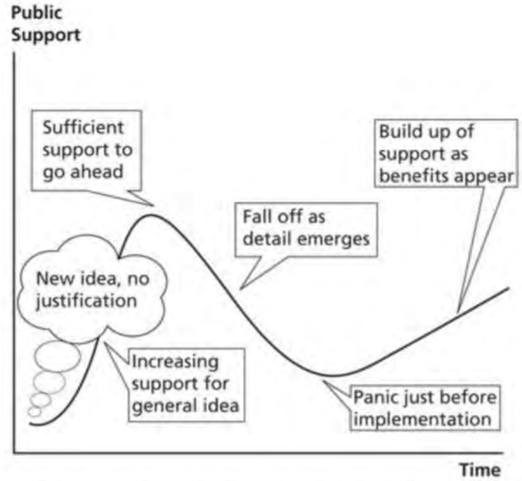

Figure 10. "The gestation process for road pricing schemes" – reproduced from (Goodwin, 2006).

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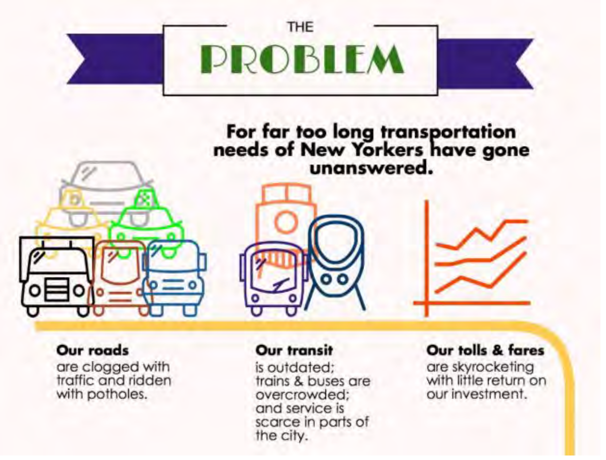
LESSONS LEARNED: NEW YORK CITY

Something for Everyone

- Coalitions of elites are <u>not</u> effective coalitions
- A crisis that affects only one group isn't the same as a multimodal crisis
- Putting equity at the forefront can help to shape the conversation
- Messaging early, often, clearly, and consistently is key
- Consensus is a nice-to-have, but not a need-to-have



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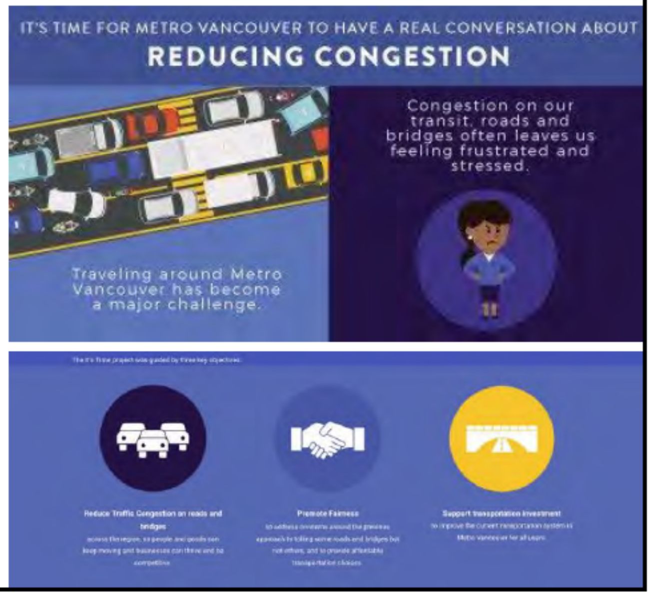
LESSONS LEARNED: VANCOUVER

Flexibility is Key

- Education is critical
- People don't want to pay for something additional
- Articulating benefits is harder than quantifying costs
- Programs and approaches can change over time, but goals must stay consistent
- It's not an all-or-nothing proposition, and tradeoffs may be needed



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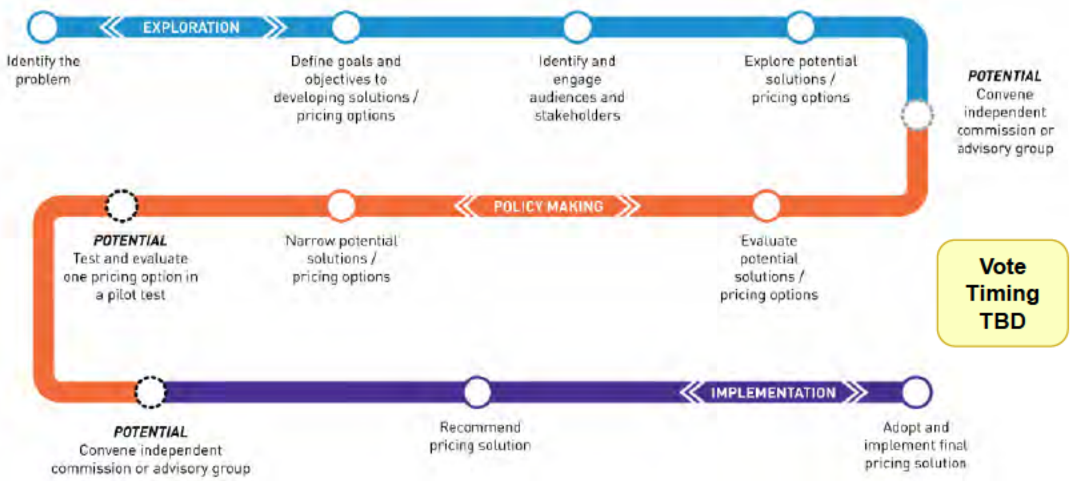
POTENTIAL SEATTLE APPROACH

Stages in Policy Development



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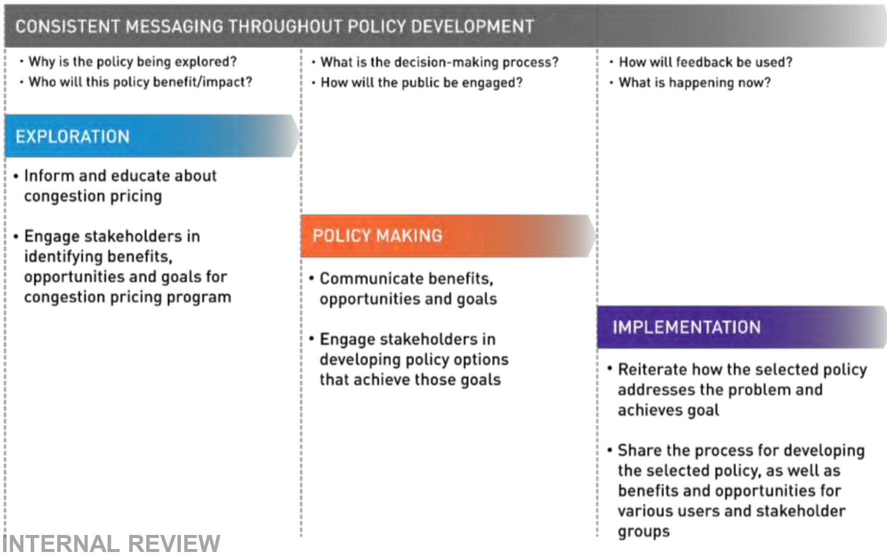
POTENTIAL SEATTLE APPROACH

Communications and Messaging Milestones



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CLARIFYING OPPORTUNITIES

Articulate the Input Desired

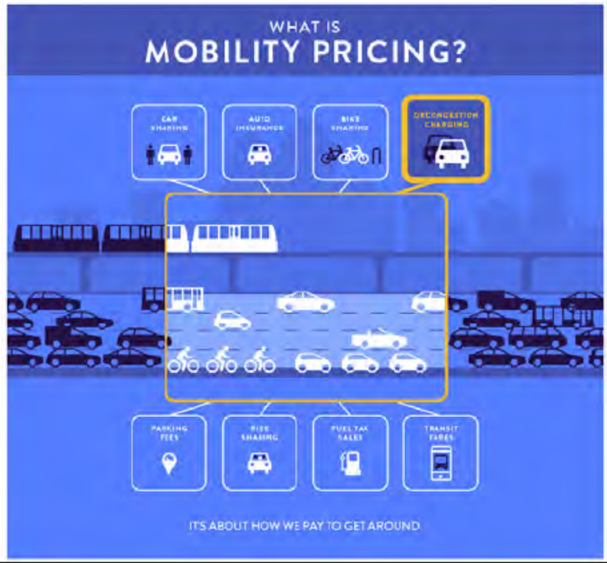
INCREASING IMPACT ON THE DECISION

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision. We will seek your feedback on drafts and proposals.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will work together with you to formulate solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

FEEDBACK AND NEXT STEPS

Approach to Engagement

- What are we asking people?
- When do we begin to engage?
- Who are our priority targets?



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NEXT STEPS

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CONFIRM GOALS

Prioritizing our Values

- Congestion reduction
- Climate mitigation
- Equity
- Revenue potential
- Livability
- Ease of implementation

Are these set or part of our engagement?

An effective, farsighted, and fair regional mobility pricing policy for Metro Vancouver should:

Congestion

A. Deliver meaningful reductionsin traffic congestion
B. Ensure everyone pays a fair share
C. Coordinate all the ways we pay for mobility including new and emerging services

Fairness

A. Be consistent and explainable
B. Support equity
C. Align prices for road use with access to transit

Support investment

A. Ensure accountability in the way revenues are used
B. Not have raising revenue as itsprimary aim

Other considerations

A. Deliver positive economic benefits
B. Protect individual privacy
C. Be predictable, but adaptable
D. Support goals for regional growth, climate change, and the environment
E. Continue to be explored with the public and stakeholders

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DEFINE PROGRAM

Getting Specific

- Having a clear program definition is critical for further analysis
- A tolling and revenue study is only possible with more specificity

What program(s) do we evaluate moving forward?

DRAFT FOR INTERNAL REVIEW

ESTABLISH ROLES AND BUDGET

Who Leads and With What Resources

- Identify dedicated staffing with clear roles and responsibilities
- Clarify budget for analysis and engagement
- Determine opportunities to leverage partnerships and funding

What are our 2019 priorities?

DRAFT FOR INTERNAL REVIEW

Thank You!

NELSON
NYGAARD

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DRAFT FOR INTERNAL REVIEW

From: Simpson, Kristen
Sent: Tuesday, January 22, 2019 3:34 PM
To: Adkins, Genesee; Helmbrecht, Elliot; Krawczyk, Tracy
Subject: RE: draft pricing materials
Attachments: DRAFT Congestion Pricing Tools Screening_20181115.docx; DRAFT Pricing Tools, Technologies, and Legalities White Paper_20181221.docx; DRAFT Impacts and Benefits Analysis White Paper_20190121.docx

Hello again-
The draft materials highlighted below are attached. If you have limited reading time, I might suggest waiting for the executive summary (which you'll see late in the day tomorrow), reading it first, then dipping into the other materials if you want more detail on anything you read in the summary.
Kristen

From: Simpson, Kristen
Sent: Friday, January 18, 2019 4:45 PM
To: Adkins, Genesee <Genesee.Adkins@seattle.gov>; Helmbrecht, Elliot <Elliot.Helmbrecht2@seattle.gov>; Krawczyk, Tracy <Tracy.Krawczyk@seattle.gov>
Subject: draft pricing materials

Hi Genesee, Tracy and Elliot,
The draft materials you'll be seeing for review are listed below, along with when you'll see each. Most of them could be combined into a consolidated report, but for now they are separate.

1. A draft Pricing and Equity white paper (attached)
2. A draft Messaging and Comms Best Practices white paper (attached)
3. A draft Opportunity Statements piece (attached) – this is a first cut at something that could be used in the initial stakeholder conversations. Note that page 10 is being revised to focus more on transit needs.

[redacted]

7. A draft executive summary (Wednesday 1/23)

Kristen

Kristen Simpson, AICP
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DRAFT CONGESTION PRICING TOOLS SCREENING MEMO

INTRODUCTION

In response to ever-increasing traffic and with the realization that metropolitan regions cannot build themselves out of congestion, various congestion pricing solutions have been piloted and adopted globally. Congestion pricing uses the economic principal of supply and demand to manage traffic. By imposing an additional cost to using a certain mode of transportation, travelers are given a pricing signal to alter their transportation choice. As the congested mode of transportation becomes more expensive, alternative transportation modes become more attractive.

The following draft goals begin to articulate why the Seattle Department of Transportation (SDOT) is studying congestion pricing. These preliminary goals are based on ideas generated from several workshops with SDOT staff to 1) explore how equity can be applied to a pricing program and throughout the planning and implementation; 2) identify potential impacts and benefits of a pricing program; and 3) understand the universe of pricing tools and mechanisms available and in use in other cities.

Draft Congestion Pricing Goals	
1	**Create a more equitable transportation system**
Reinvest in affordability and housing	
Increase and improve transportation options for low-income populations	
Democratize decision-making power regarding mobility options	
2	**Improve climate and health**
Change travel behavior to support more active and sustainable modes	
Decrease peak period congestion and particulate matter	
Encourage more fuel-efficient or fossil-fuel-free travel	
3	**Decrease traffic congestion**
Make travel to/through Seattle more predictable and reliable for people and goods	

POTENTIAL PRICING TOOLS

There are many potential pricing tools available, and some tools may achieve certain goals better than others. Ultimately, the City may need a combination of tools to achieve its goals, as there is no one tool that can do everything. The following table introduces the tools screened for Seattle.

Pricing Tools Summary

Pricing Tool	Description
Cordon Pricing	Charge vehicles crossing the boundary into a cordon pricing zone

Pricing Tool	Description
Area Pricing	Charge vehicles crossing the boundary and driving inside an area pricing zone
Fleet/Vehicle Class Pricing	Apply targeted pricing to specific vehicle types entering a zone, such as ride-hailing fleets or commercial vehicles
On-Street Parking Pricing	Vary street parking prices to control demand
Off-Street Parking Pricing	Apply a variable fee/tax to off-street parking facilities
Road User Charge (RUC)	Restrict access to a zone to vehicles enrolled in a RUC program that replaces fuel tax with payment per mile traveled, by time of day, and/or location traveled
Arterial Toll Roads	Price entire arterial roads
Arterial Express Lanes	Convert or add some lanes on arterial roads as tolled lanes, such as converting bus-only lanes or an existing general-purpose lane
Connected/Autonomous Vehicle (C/AV) Zone	Create a zone that allows only licensed connected/autonomous vehicles

SCREENING THE TOOLS

These nine tools were screened using a process designed to prioritize the most promising congestion pricing approaches for further study and refinement. The assessment was informed by the preliminary goals and desired outcomes, as well as the six key steps to pricing TransForm is developing as part of its congestion pricing and equity toolkit, which will be released by December 2018. It is similar to the process Vancouver is employing, described in Appendix A.

Six Key Steps in Pricing	
1.	Identify Who, What, and Where
2.	Define Equity Outcomes and Performance Indicators
3.	Determine Benefits and Burdens
4.	Choose Programs that Advance Transportation Equity
5.	Provide Accountable Feedback and Evaluation
6.	Anticipate and Plan for Future Opportunities

With these key steps, preliminary goals, and desired outcomes, the screening process applied the following scoring metrics and scale to qualitatively assess each potential pricing tool:

Metrics

Metric	Definition
Equity	Higher scores are given to tools that would equitably distribute costs across target populations; support reinvestment in housing and affordability through the creation of new revenue sources; support more and better transportation options for low-income people; and democratize decision-making power regarding mobility options.
Climate and Health	Higher scores are given to tools that would encourage a mode shift from auto use to walking, cycling, and transit; reduce peak-period congestion and associated air contaminants and particulate matter; and increase fuel-efficient or fossil-fuel-free travel.

Congestion Reduction	Higher scores are given to tools that reduce congestion through one of three primary levers: ▪ Location: Manage road travel at busy locations ▪ Time: Manage road travel at busy times of the day ▪ Distance: Manage or reduce total vehicle miles traveled
Implementation Feasibility	Higher scores are given to tools that could be implemented with greater ease, with lower technical challenges and risks, and with a better user experience (including understandability and convenience).

Scale

Score	Potential	What Defines the Score
1	Low	The tool can influence some or all of the elements associated with this criterion but only at a small magnitude relative to the other tools.
2	Moderate	On balance, the tool has moderate potential to influence this criterion.
3	High	On balance, the tool has high potential to meaningfully influence this criterion.

The scoring and rationale for each individual congestion pricing tool is provided below, followed by a summary table of these coarse screening results. Composite scores for each strategy, provided in the summary table, are the sum of each metric's individual scores, and can range between 8 and 24.

Cordon Pricing

Equity		Climate and Health		Congestion		Implementation	
Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Benefits	Within Seattle	Through Seattle	Ease	Cost
1	2	2	2	2	3	2	2

Evaluation Rationale:

Cordon pricing is a toll for vehicles crossing the boundary into a pricing zone. Although this measure could provide moderate funding resources for reinvestment in housing and affordability, it is not well-suited for equitably distributing the cost burden of the toll by exempting or targeting populations of interest. Furthermore, it is a "pay-to-play" strategy that may effectively exclude lower-income populations from accessing high-demand parts of the city. Abundant access to transit alternatives into and out of the cordon could mitigate this negative impact.

Cordon pricing can be varied over the course of the day to discourage vehicle use during the most congested hours. The cordon boundary can also be drawn around the most congested parts of the city, making it a flexible and effective option for reducing congestion at specific "hot spots." However, because the charge is incurred only upon *crossing* the cordon boundary, this strategy may not reduce trip *length* or discourage vehicle trips starting and ending *within* the cordon area—the larger the cordon, the greater this challenge becomes.

Implementation of this strategy may be challenging depending on the road network in question or the size of the cordon area. Areas with fewer entry or exit routes are better-suited for easy and cost-effective cordon implementation. Larger areas with many routes in or out result in higher

operating and capital costs, stemming from a higher number of gateways to maintain. may encourage drivers to circumvent payment points by diverting onto unmonitored side streets. Digital location trackers may address these implementation challenges without the need for excess on-street infrastructure, but they may also carry significant technical risks. The overall cost of implementation would depend on the size of the cordon, the choice of technology, and the complexity of the pricing scheme.

Recommendation: Include for Further Study

Cordon pricing is easier to implement than area pricing or road user charges, and can provide moderate funding resources for reinvestment in housing and affordability. However, known challenges include its flexibility in addressing equity goals or reducing vehicle travel within the target area.

Area Pricing

Equity		Climate and Health		Congestion		Implementation	
Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Benefits	Within Seattle	Through Seattle	Ease	Cost
2	3	2	2	3	3	1	1

Evaluation Rationale:

Area pricing is a toll for vehicles driving *within* a pricing zone. As with cordon pricing, this measure represents moderate reinvestment potential but may be difficult to use for precisely targeting or exempting particular populations. It also represents a "pay-to-play" strategy that could exclude populations who can't afford the charge from accessing high-demand parts of the city. Abundant access to transit alternatives into, out of, and within the priced area could mitigate this negative impact.

Area pricing charges can be varied over the course of the day to target the most congested hours, and the cordon itself can be drawn to target the most congested parts of the city, making it is a very effective congestion-reduction strategy. It is more effective than cordon pricing for reducing congestion *within* the cordon, and it encourages drivers to make both *fewer* trips as well as *shorter* trips.

Implementation of area pricing is likely to be more difficult than cordon pricing, as it requires either a sophisticated on-board monitoring technology for all drivers or an extensive on-street monitoring and tolling system within the congested area. An on-board system may be less effective in areas with large numbers of inter-regional drivers (who would not be typically equipped with the required monitoring technology).

Recommendation: Include for Further Study

Area pricing has a high potential to reduce congestion as well as a high degree of flexibility in pricing and program design, and further investigation into available technologies may reveal an opportunity to implement this strategy within the cost constraints of the project.

Fleet Pricing

Equity		Climate and Health		Congestion		Implementation	
Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Benefits	Within Seattle	Through Seattle	Ease	Cost
3	1	2	2	1	1	2	3

Evaluation Rationale:

Fleet pricing is a charge on specific vehicle types, such as taxis or freight vehicles. It can be a highly-targeted approach, which can help prevent the cost burden of the program from impacting low-income populations. However, a highly-targeted approach may also limit the reinvestment potential or congestion that could be eliminated with this strategy. For some target vehicle types, cost burdens could also be passed along to other users (for example, a fleet pricing strategy aimed at TNC drivers may be passed along to riders as part of the fare).

This strategy could be designed to discourage the use of certain types of high-polluting vehicles, which would improve local air quality and create positive health impacts. However, the narrow focus of this strategy limits the overall impact on regional health and congestion.

This strategy is likely to be easy and inexpensive to implement. Depending on the vehicle type that is targeted for fleet pricing, the charge could be incorporated into an existing registration fee or permitting process. A more sophisticated pricing scheme would require more resources for monitoring and enforcement.

Recommendation: Include for Further Study

Fleet pricing is a focused approach that can be used in conjunction with other strategies with low cost and resource requirements. Despite its composite score being lower than off-street parking pricing and tolling arterial roads, these attributes merit further study for this strategy in a paired implementation approach.

Road User Charge

Equity		Climate and Health		Congestion		Implementation	
Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Benefits	Within Seattle	Through Seattle	Ease	Cost
2	2	3	3	3	2	1	1

Evaluation Rationale:

Road user charges would replace the fuel tax with payment per mile traveled on downtown roads. This strategy can be designed to charge a flat fee per mile for all users of the road network, or it

can be designed to vary the fee depending on distance, time, location, or user type. A more flexible design would allow for a more equitable distribution of the cost burden of this strategy. The reinvestment potential is very high, but use of the revenue is likely to be highly competitive as fuel tax revenues decline and current fuel tax beneficiaries seek alternative revenue streams.

Climate and health impacts of this strategy are likely to be very positive, with a high potential for reducing vehicle miles traveled in the downtown area. Congestion within Seattle would likely be dramatically reduced, but the strategy may not have as large of an impact on congestion outside of the priced area. As with area pricing, implementation of a road user charge would require monitoring technology on board all vehicles within the target area, which would represent a significant cost and technological risk.

Recommendation: Include for Further Study

A road-user charge is likely to have a major impact on congestion with a high degree of flexibility and adaptability in pricing and program design.

On-Street Parking Pricing

Equity		Climate and Health		Congestion		Implementation	
Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Benefits	Within Seattle	Through Seattle	Ease	Cost
1	2	1	1	1	1	2	1

Evaluation Rationale:

On-street parking pricing would vary street parking prices to control demand. It is a supply-side strategy that has limited potential for targeting or exempting particular populations. As with cordon pricing and area pricing, parking pricing is a "pay-to-play" strategy that may disproportionately discourage, exclude, or burden lower-income populations from accessing high-demand parts of the city. Abundant access to transit alternatives could mitigate this negative impact.

Climate, health, and congestion benefits of this strategy alone are likely to be small. However, it could be used in conjunction with other measures or initiatives to discourage car ownership and encourage alternative travel modes. The ease and cost of implementing an on-street parking strategy depends on the existing parking payment technology and the sophistication of the pricing strategy desired—more dynamic pricing structures will require more sophisticated on-street technology and monitoring efforts.

Recommendation: Do Not Include

On-street parking pricing has limited potential to meaningfully reduce congestion or generate revenue to fund other mitigation efforts.

Off-Street Parking Pricing

Equity		Climate and Health		Congestion		Implementation	
Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Benefits	Within Seattle	Through Seattle	Ease	Cost
2	2	2	2	2	1	1	2

Evaluation Rationale:

Off-street parking pricing would apply a fee or tax to off-street parking lots. Off-street parking typically represents a large percentage of the parking supply in a downtown area, and is more likely to be associated with daily commute behavior than on-street parking. The potential for reducing congestion and providing health and climate benefits through an off-street parking fee or tax is moderate, though traffic passing through Seattle is unlikely to be impacted.

Implementing an off-street parking pricing program may be challenging, as cooperation with private parking facility owners and operators may be difficult and time-intensive. Monitoring and enforcement costs are likely to be higher than on-street parking pricing.

Recommendation: Do Not Include

Off-street parking pricing has more congestion reduction potential than on-street parking pricing, but may be better implemented as a transportation demand management (TDM) program through other city-led commute management efforts.

Arterial Toll Roads

Equity		Climate and Health		Congestion		Implementation	
Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Impacts	Within Seattle	Through Seattle	Ease	Cost
2	1	2	1	1	3	3	2

Evaluation Rationale:

Tolling arterial roads would charge a fee for all road users on major highways or surface streets. This strategy targets regional infrastructure, and therefore distributes the cost more consistently across residents from different areas. The reinvestment potential is significant, though it is inversely proportional to the congestion reduction impact—the more effective a toll is at discouraging driving, the less reinvestment potential it generates.

The congestion reduction potential is high, though it is likely to have a localized effect rather than regional congestion reduction impact. Implementation is relatively easy and cheap, and can be accomplished with widely-used and readily available technology.

Recommendation: Do Not Include

While tolling arterial roads has a high potential to reduce congestion through Seattle would be easy to implement, congestion reduction impacts are likely to be localized and long-term reinvestment potential is low.

Arterial Express Lanes

Equity		Climate and Health		Congestion		Implementation	
Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Impacts	Within Seattle	Through Seattle	Ease	Cost
1	1	1	1	1	2	2	3

Evaluation Rationale:

Creating arterial express lanes would involve converting some lanes on major arterial roads or highways to tolled lanes. These lanes offer drivers the option of paying a fee for a quicker commute. As a "pay-to-play" strategy, it is unlikely to provide equitable congestion reduction benefits or heath and climate impacts. Though this strategy is relatively easy and inexpensive to implement, reinvestment potential and congestion reduction impacts are likely to be low and localized.

Recommendation: Do Not Include

Arterial express lanes are unlikely to significantly reduce congestion or provide other public benefits.

Connected/Autonomous Vehicle Zone

Equity		Climate and Health		Congestion		Implementation	
Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Impacts	Within Seattle	Through Seattle	Ease	Cost
1	1	1	1	1	1	1	1

Evaluation Rationale:

A connected/autonomous vehicle (AV) zone would designate a certain area or portion of the street network for the exclusive use of connected/autonomous vehicles. This strategy is unlikely to be effective at reducing congestion or providing additional health, climate, or equity benefits. High projected initial cost of autonomous vehicle ownership would exclude lower- and middle-income populations from use of a connected/autonomous vehicle zone in the near-term, which would be detrimental to Seattle's equity goals.

The timeframe during which this strategy would be effective at reducing congestion is narrow, requiring a sufficiently high number of AV users to justify dedicating road space for exclusive use but a low enough number of users to make access to such a space a "special" benefit. As AV market penetration increases, congestion levels in the connected/autonomous vehicle zone could likely return to pre-program levels or worse.

Recommendation: Do Not Include

Designating a connected/autonomous vehicle zone for exclusive use is unlikely to be an effective congestion mitigation strategy in the near- or long-term.

SUMMARY FINDINGS

Four tools are recommended for further study:

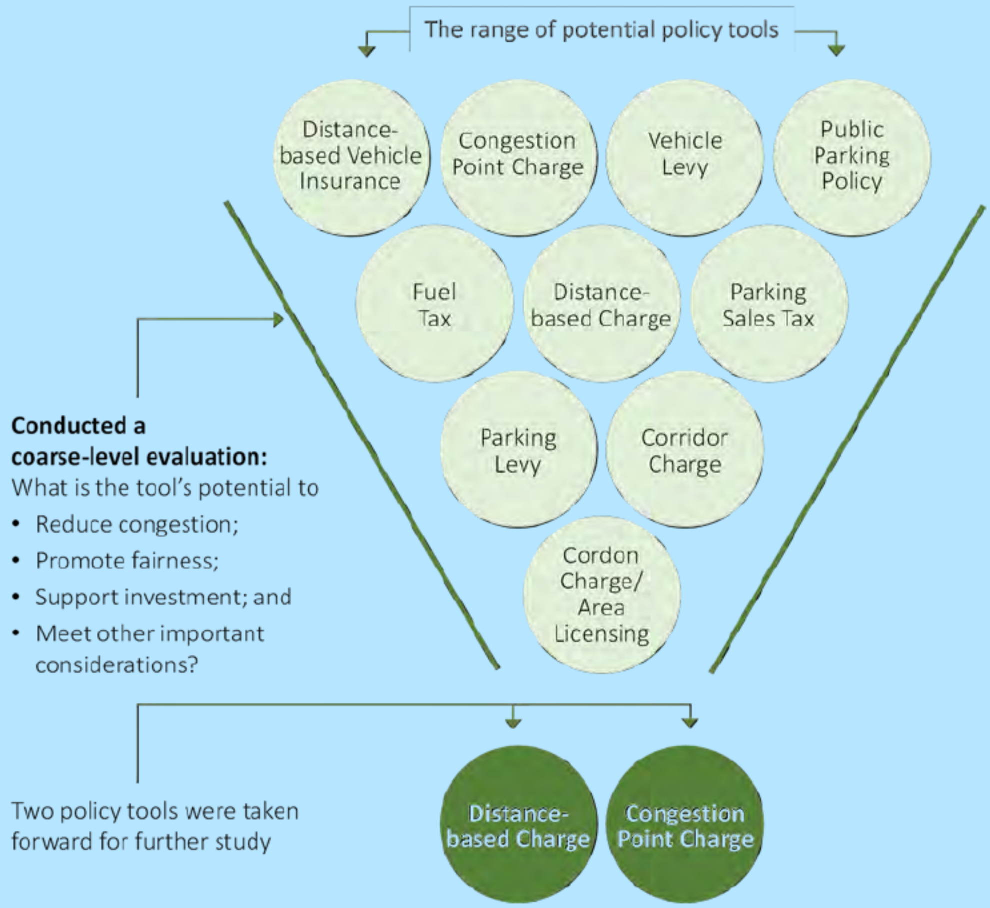
- Cordon Pricing
- Area Pricing
- Fleet Pricing
- Road User Charge

These stand out as tools with the most individual potential to meaningfully influence and balance across the draft goals. While fleet pricing is not one of the top scoring tools, its highly-targeted approach, relative ease, and low cost to implement merits evaluating it further as a possible complementary strategy. Fleet pricing could be an effective supplement, coupled with one or more of the other three recommended tools.

Pricing Tool	Composite Score	Equity		Climate and Health		Congestion		Implementation	
		Equitable Cost Burden	Reinvestment Potential	Climate-Friendliness	Health Benefits	Within Seattle	Through Seattle	Ease	Cost
Cordon Pricing Toll for vehicles crossing the boundary into a pricing zone	16	1	2	2	2	2	3	2	2
Area Pricing Toll for vehicle driving inside a pricing zone	17	2	3	2	2	3	3	1	1
Fleet Pricing Targeted pricing of specific vehicle types	13	3	1	2	2	1	1	2	3
Road User Charge Replace fuel tax with payment per mile traveled on downtown roads	17	2	2	3	3	3	2	1	1
On-Street Parking Pricing Vary street parking prices to control demand	10	1	2	1	1	1	1	2	1
Off-Street Parking Pricing Apply a fee/tax to off-street parking lots	14	2	2	2	2	2	1	1	2
Arterial Toll Roads Price entire roads	15	2	1	2	1	1	3	3	2
Arterial Express Lanes Convert some lanes to tolled lanes	12	1	1	1	1	1	2	2	3
Connected/Autonomous Vehicle Zone Create connected/autonomous vehicle-only zones	8	1	1	1	1	1	1	1	1

Appendix A Case Study: Vancouver, BC

Vancouver has mounting congestion, continued population growth, and two bridges that were tolled while others were not, leading some to drive extra distances to avoid the cost. While some type of bridge tolling or congestion charging seemed a likely outcome, Vancouver created an Independent Pricing Commission that studied a broad range of alternatives. They first adopted a set of transportation goals that included promoting fairness in transportation costs and impacts. They then evaluated which alternatives, if any, could best achieve their goals. After detailed analysis and community input, they settled on the two potential alternatives that seemed to be the best fit: distance-based charges and congestion point charges (similar in principle to cordon charges).



DRAFT PRICING TOOLS, TECHNOLOGIES, AND LEGALITIES WHITE PAPER (1/21/19)

Introduction

In response to increasing road traffic congestion and the realization that metropolitan regions cannot build themselves out of this problem, a variety of congestion pricing solutions have been piloted and adopted globally. The City of Seattle is among several cities in North America that recognizes pricing's potential to reduce congestion and improve mobility, leading the Seattle Department of Transportation (SDOT) to explore potential tools and their application in other places. This white paper provides a summary of congestion pricing tools, their objective merits and drawbacks, how they might be applied to the City of Seattle given current legal frameworks and existing and emerging technologies.

Background

Congestion pricing uses the economic principle of supply and demand to manage traffic. By applying an additional cost to using a certain mode of transportation at congested times and locations, a municipality can encourage travelers to reconsider their transportation choices. A small reduction in the number of vehicles on a congested road can translate to a big reduction in congestion. Additionally, as one mode of transportation becomes more expensive, alternative transportation modes can become relatively more attractive. For example, increasing prices on a tolled road during rush hour can make the choices of taking transit, carpooling, shifting travel times, using a different route, or eliminating the trip altogether more attractive than paying the higher toll. Which option a traveler will choose depends on their value of time for that trip, budget, availability of alternatives, and other preferences.

The City of Seattle is evaluating the range of available pricing tools to determine which best meet the goals of providing congestion relief, reducing climate impacts, and improving health and equity. Some tools may achieve certain objectives better than others. The City may consider using discounts and exemptions in combination with any of the pricing tools to further influence behavior or to support multiple objectives. Discounts and exemptions can mitigate negative equity impacts or provide further incentives for travelers to choose a certain transportation mode.

Ultimately, the City will need a combination of tools to achieve its goals, as no single tool can do everything. Choosing multiple pricing tools and discount strategies increases policy complexity and the challenge of communicating with travelers, implementing the program, and ensuring payment. Increasing complexity can also make enforcement more difficult, allowing more opportunity for people to cheat the system. The next sections summarize the pricing tools shown in Table 1. This is followed by a discussion of technologies, as well as legal implications of the various tools.

Table 1. Pricing Tools Summary

Pricing Tool	Description
Cordon Pricing	Charge vehicles crossing the boundary into a cordon pricing zone
Area Pricing	Charge vehicles crossing the boundary and driving inside an area pricing zone

Pricing Tool	Description
Fleet/Vehicle Class Pricing	Apply targeted pricing to specific vehicle types entering a zone, such as ride-hailing fleets or commercial vehicles
Connected/Autonomous Vehicle (C/AV) Zone	Create a zone that allows only licensed connected/autonomous vehicles
Fossil Fuel Free Zone (FFFZ)	Create a zone that only allows licensed non-fossil fuel vehicles, such as all electric and hydrogen vehicles
License Plate-Based Restriction Zone (LPRZ)	Restrict vehicle access into a zone based on vehicle license plate numbers
Road User Charge (RUC)	Restrict access to a zone to vehicles enrolled in a RUC program that replaces fuel tax with payment per mile traveled, by time of day, and/or location traveled
Arterial Toll Roads	Price entire arterial roads
Arterial Express Lanes	Convert or add some lanes on arterial roads as tolled lanes, such as converting bus-only lanes or an existing general-purpose lane
On-Street Parking Pricing	Vary street parking prices to control demand
Off-Street Parking Pricing	Apply a variable fee/tax to off-street parking facilities

Pricing Tools Overview and Applicability to Seattle

The sections that follow describe each of the tools shown in Table 1, identify how the tool might be applied in Seattle, and introduce potential pros and cons associated with possible implementation.

Cordon Pricing

Cordon pricing is the concept of charging vehicles a fixed or variable toll for entering and/or exiting a congested zone within a city. Pricing can vary according to vehicle type (e.g., private or commercial vehicles, cars or trucks) and by time of day (e.g., depending on traffic conditions). Typically, tolling equipment is placed on all roads leading into and out of a cordon zone. Toll collection equipment at cordon boundaries identifies vehicles through the use of toll transponders and/or license plate recognition camera systems, and toll amounts are either deducted from toll accounts or are sent to vehicle owners as toll invoices. Cordon boundaries are selected to optimize benefits as defined within the policy, minimize unwanted effects such as diversion, and balance the cost of tolling infrastructure. Cordon pricing in Singapore and Stockholm has reduced congestion, reduced emissions, and generated revenue for reinvestment in the transportation system.

Figure 1. Tolling gantry with transponder and license plate camera used for cordon and area pricing

Applicability to Seattle

The size and extent of a cordon pricing zone in Seattle could vary depending on the desired amount of or locations for congestion reduction (and other program objectives). [redacted]

[redacted]

Pros

Cordon pricing is easy to explain to the public and effective at reducing traffic into a zone. In addition, cordon pricing can be applied in a very flexible manner to support achieving nuanced goals like reducing congestion during certain time periods or reducing congestion caused by specific vehicle types. The tolling infrastructure could also be used for other purposes, such as augmenting traffic data feeds and enlarging the City's communications network. Finally, cordon pricing could generate revenue that would more than offset implementation and operations costs and likely generate a revenue stream for reinvestment in the transportation system.

Cons

To ensure collection of a toll from every vehicle crossing the cordon, the City would need to install a significant amount of roadside toll collection equipment and establish back-office functions; both have high up-front capital costs and ongoing operations costs. The location of charge points would need to be carefully chosen to avoid unwanted boundary effects, such as diversion that could increase traffic in neighborhoods adjacent to the cordon zone. To be effective, travelers must know what they will pay at the point when they are making decisions about travel mode or time. Therefore, to take advantage of dynamic pricing approaches that respond to congestion levels or air quality or those that vary by vehicle type or income level, Seattle would need robust strategies for communicating the pricing structure.

Area Pricing

Area pricing is very similar to cordon pricing. It has the added feature of also charging vehicles that drive *within* a pricing zone, not just those crossing the zone's boundary. This approach is best suited for geographically large pricing zones where vehicles driving within a zone may not necessarily cross the zone's boundary but still contribute to congestion. Area pricing relies on tolls collected electronically with tolling equipment placed at strategic locations within a pricing zone and as well as at its boundaries. London has successfully implemented an area pricing program.

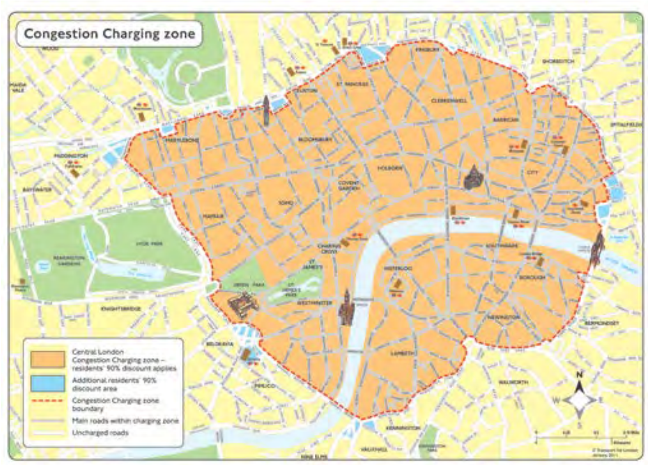


Figure 2. Map of London's area pricing zone

Applicability to Seattle

Similar to cordon pricing, area pricing would [redacted] (to capture their role in contributing to congestion). Area pricing would be more effective than cordon pricing because it would capture vehicles that stay within the zone throughout the day, such as ride hailing and delivery vehicles.

Pros

In addition to the benefits of cordon pricing, area pricing can make a pricing structure fairer since it applies to those within the cordon as well as those traveling into the congested (and priced) area.

Cons

To achieve the extra benefits mentioned above, area pricing is more complex and requires more infrastructure than cordon pricing; therefore, it has higher capital and operating costs. As the congested area (and the area priced) grows larger, area pricing could bring more benefits and become more cost effective.

Fleet/Vehicle Class Pricing

Figure 3. Example of tolling equipment used for truck tolling in Germany

Fleet pricing prices certain types of vehicles charging a fee or toll for driving in a particular area. Pricing a large enough fleet of vehicles could reduce the number of vehicles in a congested area and improve traffic flow. For example, pricing delivery vehicles could alter traffic disruptions caused by deliveries during rush hour. In addition, pricing vehicle classes that emit greater levels of pollution could reduce their use and have a positive effect on air quality. Imposing a fee or a toll on vehicles can be done as part of annual vehicle registration or with on-board vehicle use monitoring devices, such as fare collection systems in taxis or truck GPS units. On-board vehicle devices allow prices to vary by time of day. New York City is implementing fleet pricing on taxis and other ride-hailing services. Many parts of Europe have truck-specific tolls in place to cover the costs of road operations and maintenance.

Applicability to Seattle

Figure 4. Port of LA terminal gate associated with the Pier Pass pricing program

Seattle could leverage the current ride-hailing and taxi regulatory and licensing framework to add charges by time of day or location. To price commercial vehicles, the city could engage the Port of Seattle and trucking associations to develop a methodology. An example of targeted truck pricing would be applying a container truck toll charge similar to the Pier Pass program at the Port of Los Angeles and Port of Long Beach.

Pros

Fleet pricing can be implemented relatively easily, especially if it leverages existing systems or infrastructure like vehicle registration or ride-hailing service payment systems. Vehicle class pricing could allow Seattle to target high emission vehicles in addition to congestion, directly supporting multiple city goals. Like cordon and area pricing, fleet pricing could generate sufficient revenues to offset the costs of implementing the program. Fleet pricing would pair well with other congestion pricing options.

Cons

Focusing only on vehicle fleets and vehicle classes may not impact enough vehicles to have a measurable effect on congestion or air quality. In addition, operators with low margins, such as owner-operators of port drayage trucks, may be more likely to drive high emission vehicles without the means to meet stricter emissions standards, so targeting such vehicles may be an inequitable solution.

Connected/Autonomous (C/AV) Vehicle Zone

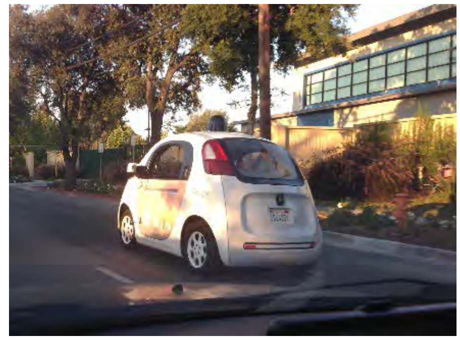


Figure 5. Example of a Waymo autonomous vehicle

A cross between a vehicle restricted zone and fleet pricing, a C/AV zone would allow only licensed connected and autonomous vehicles into a zone that is otherwise restricted to pedestrians, bicyclists, and transit vehicles. Such a zone could help to achieve efficiency gains projected for pure C/AV vehicle fleets. Since these vehicles have identification and communications technologies embedded, Seattle would have many options for licensing their entry into a particular area, from traditional electronic toll collection methods to mobile apps. Given that C/AV is cutting-edge technology, this approach has not yet been implemented.

Applicability to Seattle

The limits of a C/AV zone could be very similar to a cordon pricing zone, although the zone size would likely be relatively small since limiting access to C/AV would likely cause major traffic diversion around the zone's boundary until C/AVs are widely used.

Pros

In the near term, a C/AV zone could help Seattle eliminate most vehicles in an area without having a "ban" on all vehicles. Simultaneously, commuters could be incentivized to use C/AVs and automakers would be incentivized to promote them, accelerating the value of the zone. Revenues from licensing access to a C/AV zone could support other commuter and equity-focused programs.

Cons

Lack of a significant C/AV vehicle fleet in the region could create a major traffic disruption for many years, as C/AV technology and regulations are still in their infancy. Therefore, this approach would need to be paired with a cordon or area pricing approach until the region has enough C/AVs. Depending on the ownership structure of C/AVs—such as more private ownership of vehicles rather than shared fleets—transportation inequalities could be exacerbated if C/AVs are too expensive for many to afford. As with cordon and area pricing, there would be enforcement infrastructure and operations costs, which would not likely be covered by revenues from a C/AV-only zone in the near term.

Fossil Fuel Free Zone (FFFZ)

Figure 6. Map of Milan's emissions-based pricing area

Similar to the C/AV concept, a FFFZ would allow only clean-air vehicles not powered by gasoline or diesel, such as electric and hydrogen-fuel vehicles, to enter a zone otherwise limited to pedestrians, cyclists, and transit riders. Many regions in the United States provide special access for clean-air vehicles to use HOV and express lanes, but an FFFZ takes the concept further by restricting access to all but these vehicles within specific geographies or urban areas. Milan's Area C program charges all vehicles for entering the central area and bans the most polluting vehicles altogether.

Applicability to Seattle

The limits of an FFFZ could be very similar to a cordon pricing zone, although the zone size would likely be smaller since limiting access only to electric and hydrogen

vehicles would cause major traffic diversion around the zone’s boundary in the near term. An extensive electric charging and hydrogen fueling station network would be required within the zone to support the restricted vehicle types.

Pros

Similar to the C/AV zone, an FFFZ could provide Seattle an opportunity to restrict most vehicles from an area without completely eliminating the opportunity to drive into the zone. Simultaneously, drivers would be incentivized to adopt clean air vehicles and automakers to promote them, therefore accelerating emission reduction benefits. Implementing an FFFZ would help fulfill the City of Seattle’s 2017 commitment to Fossil-Fuel-Free Streets by 2030. Revenues from licensing access to an FFFZ could support other commuter and equity-focused programs.

Cons

Given the limited existing fleet of all-electric and hydrogen powered vehicles in the region, an FFFZ could create significant traffic disruptions for a number of years. Therefore, this approach would need to be paired with a cordon or area pricing approach until the region has a significant number of clean-air vehicles. Transportation inequalities could be exacerbated given the current high cost of purchasing all-electric and hydrogen vehicles. As with cordon and area pricing, there would be enforcement infrastructure and operations costs, which may not be covered by FFFZ revenues in the near term. Charging and refueling infrastructure needed to encourage clean-air vehicles could also add costs.

License Plate-Based Restriction Zone (LPRZ)

To limit the number of vehicles that enter a specific area, License Plate-Based Restriction Zones allow only vehicles with certain license plate numbers into the zone on certain days and/or times. The approach to restrictions can range from something as simple as allowing odd or even plates on certain days to more elaborate approaches that allow ranges of numbers on certain days of the week and or times of day. Similar to cordon, area, and tolling pricing programs, LPRZs can be enforced with tolling technology and/or on-road police enforcement. Many LPRZ programs internationally were originally implemented to improve air quality and are now also used for congestion relief. Mexico City and many other Latin American cities have used this approach since the 1980s and 1990s. Some international cities, such as Beijing and Paris, have implemented temporary restrictions on severe air-pollution days.

Figure 7. Sign indicating vehicle restrictions based on license plate number on certain days and times in San José, Costa Rica

Applicability to Seattle

The limits of an LPRZ could be very similar to a cordon pricing zone. Particular attention would be required to potential traffic diversions near zone boundaries.

Pros

Restricting access to a large number of vehicles could reduce congestion significantly by incentivizing travelers to use other modes. If paired with an area or cordon pricing scheme, revenues can be used to support other commuter and equity-focused programs.

Cons

Transportation inequalities could increase if wealthier households with multiple vehicles have more opportunity to adapt to license plate restrictions. If an LPRZ approach is not paired with a cordon or area pricing program to provide a revenue stream, budget to support enforcement, alternative transportation choices, and commuter-offset programs would need to be identified.

Road User Charges (RUC)

Road User Charges, also known as a Mileage-Based User Fee or Vehicle Mileage Traveled Fee, is an approach to charging people a fee based on the number of miles their vehicle travels. Government agencies are considering RUC as a potential replacement for the existing consumption-based gas tax, especially as improving gas mileage and the increasing number of electric vehicles continues to reduce gas tax revenues. More sophisticated RUC programs vary mileage fees based on time of day and/or location to reflect congestion. RUC-enabling technologies range from a simple odometer log book and annual checks to more sophisticated in-vehicle GPS devices and mobile apps. Oregon has had a permanent RUC program in place since 2015, and many states, including Washington, are piloting RUC programs.

Figure 8. Oregon's OreGo RUC program uses several different technologies to calculate miles traveled

Applicability to Seattle

Since Washington State is proposing RUC as a long-term gas tax replacement, the City of Seattle could be an early adopter of the program and leverage the state's RUC framework to implement an additional congestion charge.

Pros

Implementation of a user fee could make a pricing program more equitable in some respects. For example, electric vehicles are not currently paying fees that match their contribution to congestion and road impacts (as they don't pay the gas tax). Pay-as-you-go programs, such as car insurance and cell phone plans, are not new to consumers, so a RUC program may be easier to explain than other types of congestion pricing. Although current RUC pricing programs are simply fixed per-mile costs, more sophisticated pricing structures could provide the City the flexibility to target congested roads and/or times of day.

Cons

Washington State's timeline for implementing RUC as a gas tax alternative is uncertain and is outside the City of Seattle's control. Because RUC is a state-level financing tool, the city would need to determine its roles and responsibilities in working with the state. Seattle could incur additional implementation and operational costs if it were to add pricing complexities not needed by the state.

Arterial Toll Roads

Tolling urban arterials is similar to tolling a highway. To date, congestion pricing programs have only tolled arterials as part of a cordon or area pricing program, placing tolling equipment at a key location along a road to enforce the cordon. Tolling the length of an arterial is generally considered more complex than tolling a highway because of the numerous access points and intersections and the potential for traffic diversion onto other urban streets. However, existing electronic toll collection technology could support such a concept.

Figure 9. Example of tolling equipment used in Singapore

Applicability to Seattle

An arterial tolling program could be implemented on key north-south corridors through the downtown core to reduce congestion, such as 2nd Avenue and 4th Avenue. A small initial launch could be expand to include a network of roads, such as Mercer Street, Elliott and Western Avenues, and Denny Way.

Pros

Tolling arterial roads targets congestion on specific roads and helps to expedite the movement of through vehicle traffic. Such a program could generate revenues to offset implementation and operating costs and fund other city priorities. Tolls could vary by vehicle occupancy, vehicle type, emissions, or by time of day or congestion level, which would allow the City to achieve multiple goals.

Cons

Tolling arterial roads is a very complex concept that may have significant barriers to implementation, including jurisdiction over arterials, coordination with state-level stakeholders, and potential traffic diversion to other Seattle streets. Since arterial tolling has not been implemented elsewhere, combining a technically feasible solution that enforces tolls along a corridor and reduces congestion on and around that arterial would be expensive and time consuming. The capital costs, including both infrastructure and tolling equipment, would be high for this approach.

Arterial Express Lanes

Restricted access in arterial lanes is relatively common in the form of bus-only lanes, such as those on 15th Avenue in Seattle. Like express lanes on freeways, arterial express lanes could also restrict access to those who meet vehicle and occupancy eligibility requirements or to those paying a toll. The state of Florida considered this concept to pay for new arterial lanes but did not implement it. Tampa, Florida has conducted a proof of concept study of a Bus Toll Lane (BTL)—a partnership between transit and toll agencies with shared funding and a revenue-sharing model—but the focus was on limited access corridors. Tolling equipment, similar to that used on freeway express lanes, would be required for such a program.

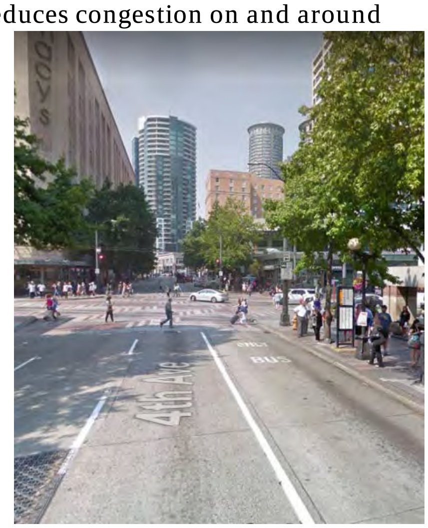


Figure 10. Bus-only lanes, such as this one on 4th Avenue in Seattle, could be considered for inclusion in an arterial express lane program

Applicability to Seattle

Similar to arterial tolling, an arterial express lanes program could target key north-south and east-west corridors. Arterial express lanes could convert and expand current bus-only lanes into dual express lanes, such as on 4th Avenue in downtown Seattle.

Pros

In general, arterial express lanes could have benefits similar to those of tolling entire arterial roads. However, limiting tolling on arterial roads to certain lanes could reduce the costs of implementation as well as traffic diversion.

Cons

Capital costs and limited right-of-way makes building new arterial express lanes cost prohibitive. Implementing arterial express lanes in Seattle would likely require converting existing general-purpose travel lanes to express lanes, which could result in more congestion in the remaining general-purpose lanes. Operational costs associated with enforcing occupancy, toll payment, and access control are significantly more complex than tolling entire roadways.

On-Street Parking Pricing

Variably priced on-street parking can be used to manage demand for parking, which has been shown to reduce congestion. Pricing on-street parking introduces a price signal that encourages some drivers to switch modes and reduces the number of drivers circling to look for parking. A combination of smart meters, embedded parking sensors, and traveler information systems are used to manage parking pricing in near real time. San Francisco is leading the nation in actively managing parking prices, and many other cities, including Seattle, have successfully implemented effective on-street pricing programs.

Figure 11. On-street parking is dynamically priced in San Francisco

Applicability to Seattle

The City of Seattle could expand the current on-street parking pricing program to include a broader area or additional time periods throughout the day, or the City could increase peak-time parking prices.

Pros

Since Seattle already manages on-street parking prices, this approach could leverage existing infrastructure. Pricing on-street parking generates revenue that can offset the cost of this or other congestion pricing programs. In addition, this approach could be combined with other congestion pricing programs to amplify congestion-reduction benefits.

Cons

On-street parking pricing alone is unlikely to have a large impact on transportation mode choice. As with many pricing programs, the ability of on-street parking pricing to change travel behavior depends on communicating the prices prior to a traveler making the choice to drive to the congested area. Thus, the congestion-reduction benefits of such a program are highly dependent on good traveler information systems.

Off-Street Parking Pricing

By pricing off-street parking in public and private lots, many regions are using these fees to influence traveler decisions about driving into certain parts of cities. Cities typically leverage existing sales or property taxes to levy parking surcharges, which are passed on to drivers. Melbourne and San Francisco are case studies for managing off-street parking prices. Seattle has also implemented off-street parking fees.

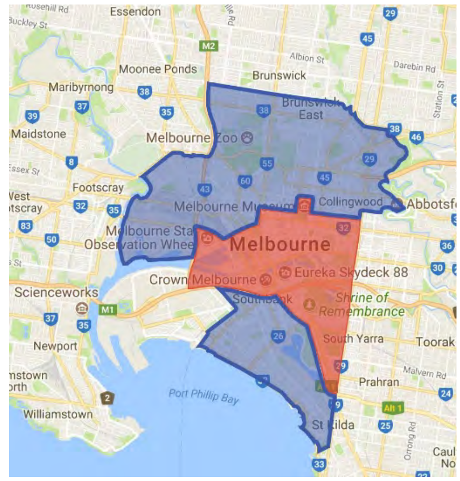


Figure 12. Example of Melbourne's parking pricing area

Applicability to Seattle

The City of Seattle could leverage existing taxation frameworks to apply a parking congestion surcharge. The charge could vary depending on time of day or days of the week to target peak congestion periods. The City could engage parking lot operators to gauge their ability to pass this pricing directly to travelers. The City could also pursue charging fees directly to drivers, but this would require implementation of new parking payment system functionalities and accounting procedures by the City and lot operators.

Pros

By leveraging existing parking payment infrastructure, pricing off-street parking could be a low-cost approach to demand management. The prices could influence regular commuters because they would apply to monthly parkers and other regular drivers. Like on-street parking pricing, this approach could be combined with other congestion pricing programs.

Cons

Demand management depends on responses to pricing signals. The method of charging the parking owner and then passing the charges through to the drivers removes the ability to directly influence driver behavior. If it was possible to charge drivers directly, there could be more implementation, auditing, and operational costs to ensure fees are charged properly.

Technology Requirements and Enablers

If Seattle selects one or more pricing tools for further study and potential implementation, the City will need to consider how the underlying technology supports Seattle's pricing program goals and objectives. The technology will perform two primary functions: accurately and correctly charging travelers; and ensuring that travelers make payments and obey restrictions (i.e., enforcement). To adequately charge and enforce, a pricing system should include the following elements:

- **Vehicle identification devices:** In addition to using images of vehicle license plates, systems can also use devices attached inside or outside a vehicle, integrated with a vehicle, and/or carried by drivers and passengers to identify vehicles.

- **Roadside detectors and enforcement equipment:** Most systems use field devices on the roadside or over the roadway to detect vehicles, whether they are paying travelers or scofflaws.
- **Back office:** Technologies are required to manage customer accounts, process transactions and payments, interface with other external systems (e.g., Department of Motor Vehicles), conduct audits and financial reconciliations, set prices, and monitor performance.

When considering a technology system to support a preferred pricing program, Seattle should assess the following:

1. *Technology maturity* – Deploying existing technologies will likely be less expensive to implement and reduce scheduling risks compared to deploying emerging or in-development technologies. However, existing technologies carry the risk of the technology becoming obsolete in the near future or vulnerable to future market disruptors. Additionally, the City should avoid proprietary technologies to reduce the risk of high costs from a sole source procurement.
2. *Physical footprint of infrastructure* – Since space and urban aesthetics will constrain equipment placement, system performance, and public acceptance, Seattle should include these factors in its technology system evaluation. For instance, a typical tolling system requires overhead mounted antennas to effectively read transponders, which may be visually intrusive. Some technologies also require intensive high-bandwidth communications, which would require construction of communications infrastructure such as conduit banks and telecommunications hubs. However, some technologies can disseminate pricing and congestion information, potentially eliminating other electronic road signs.
3. *Cost* – Seattle should consider both the upfront capital cost of implementation and ongoing operational costs to evaluate the lifecycle costs for various pricing approaches.
4. *Market penetration and interoperability* – Widespread adoption of technologies in the region and by travelers, such as Washington State Department of Transportation's (WSDOT) *Good to Go!* toll transponders and video tolling, could reduce costs and increase customer convenience. Other possibilities include interoperability with the Road User Charge program being examined by the Washington Transportation Commission, private payment systems (e.g., ride-hailing app platforms like Uber and Lyft), and accounts used for other transportation modes, like the ORCA card.
5. *Scalability and flexibility* – The City should also consider the ability of the technology to support sophisticated business rules, such as charging or applying discounts by vehicle class, time of day, and/or location. Any selected technology should have the ability to scale up from a pilot program to a region-wide system.

Technologies and approaches for pricing tools described in the previous section can be broadly categorized into three groups based on their similarities: toll-like, parking, and road user charge. The next section discuss potential technologies for these three groups of pricing programs.

Tolling Technologies

Applies to: Cordon Pricing, Area Pricing, Fleet Pricing, Arterial Toll Roads, Arterial Express Lanes, Connected/Autonomous Vehicle Zone, Fossil Free Fuel Zone, and License Plate-Based Restriction Zone

A number of the pricing tools can leverage technologies traditionally used for tolling because they share the concept of identifying a vehicle at a particular location to apply the appropriate price or enforcement consequence. Area and cordon pricing involve checking for vehicles entering and/or exiting an area; therefore, tolling equipment is placed on the edges of a pricing area or strategically distributed within a pricing area. Pricing tools based on charging specific vehicle types (i.e., C/AV or fleet pricing) and/or

restricting access to certain vehicle types (i.e., FFFZ, LPRRZ) can also use toll equipment to categorize vehicles within a zone or on the borders of a zones.

Since the introduction of electronic tolling in the 1980s, the tolling industry has made progressive advancements in Automatic Vehicle Identification (AVI) and Automatic License Plate Reader (ALPR) technologies, which identify vehicles without impeding traffic flow. Typically, AVI antennas mounted over roadways read transponders in vehicles to identify those with pre-paid toll accounts. ALPR cameras mounted overhead capture images of vehicle license plates to identify those without a transponder. The system can use the images to match a vehicle to a pre-paid account, send its owner a notice of penalty, or send post-paid invoices.

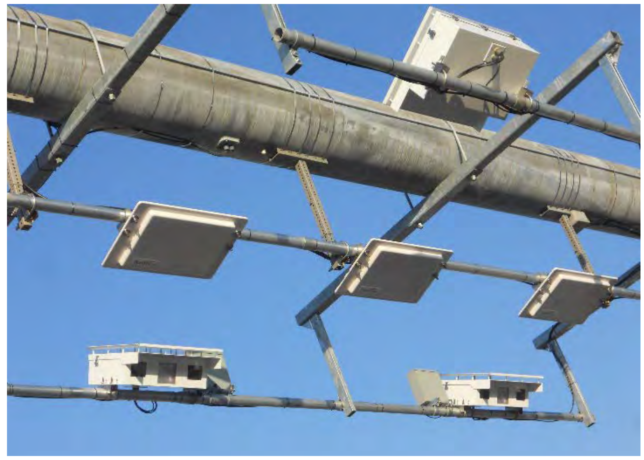


Figure 13. Example of AVI antennas to read transponders and cameras to capture license plates

Alternatively, several emerging technologies may augment and eventually replace these current AVI and ALPR technologies:

- *Cell phone apps* – Several companies are using cell phone-based technologies, such as apps, to determine vehicle location and collect tolls. The app sends the toll and the associated license plates number to the toll facility operator to reconcile with license plates captured by toll operators. Some firms also use Bluetooth-based technologies connected to their app to help identify the number of carpoolers for discounts and for occupancy enforcement. Although firms are promoting "virtual" toll points, toll operators will still need ALPR on the roadside to enforce payment from travelers without apps. Some mobile apps can also pair with devices connected to vehicle On-Board Diagnostic (OBD)-II ports to get more accurate vehicle information and mileage. Cell phone apps can also provide travelers with pricing information and reduce the need for electronic signs.

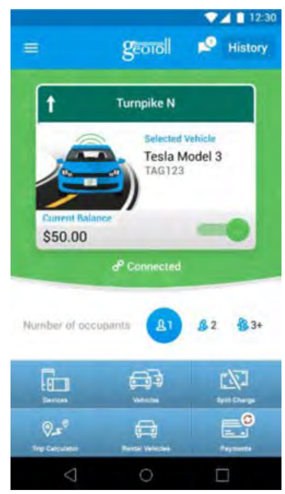


Figure 14. Cell phone apps like GeoToll can create virtual pricing boundaries

- *Dedicated Short Range Communications (DSRC)* – The National Highway Traffic Safety Administration (NHTSA) proposes to federally mandate that vehicles manufactured after 2023 have built-in vehicle communications devices to "talk" to other vehicles and roadside equipment. DSRC could allow vehicles to communicate their locations and use on-board sensors to indicate the number of vehicle occupants. DSRC could change the need for travelers to obtain transponders. However, roadside equipment to support DSRC and ALPR cameras to enforce payment by vehicles without DSRC likely will still be needed. If the NHTSA rulemaking for DSRC requirements passes, this technology could be very useful to support a C/AV Zone pricing concept. DSRC can also help vehicles receive and display pricing information to travelers and reduce the need for electronic pricing signs in the field.

- *5G LTE Wireless* – Like mobile phones, vehicle manufacturers are starting to build cellular communications capabilities into their vehicles. This technology could enable vehicles to transmit location information to self-identify and/or pay when they enter into a pricing zone or tolled roadway. Similar to DSRC, roadside equipment and ALPR cameras likely would be needed to enforce and/or charge vehicles without 5G wireless communications. Wide adoption of 5G-enabled vehicles could boost support for a potential C/AV Zone pricing concept. Similar to DSRC, 5G-equipped vehicles could receive and display pricing to travelers, thereby reducing the need for electronic pricing signs in the field.

Figure 15. Connected vehicles with DSRC or 5G LTE could enable pricing

- *Mobile License Plate Readers Improvement* – As video camera and automatic character recognition processing improve and prices are lowered, enforcement of payment and vehicle restrictions based on license plate captures could support distributed deployment of mobile ALPR. Instead of implementing tolling equipment at fixed locations, mobile ALPR systems can be mounted on roving vehicles and/or portable stations. For example, San Francisco Municipal Transportation Agency (Muni) currently mounts mobile ALPR on some transit buses to enforce illegal bus lane parking violations. The Georgia Department of Public Safety mounts mobile ALPR on police vehicles to identify potential carpool scofflaws on the I-85 Express Lanes in Atlanta. With mobile ALPR, Internet of Things (IOT) communications, and computing advancements, costly fixed-location infrastructure could be avoided. Another option that could be considered—albeit with privacy considerations as well—is the ability to leverage multiple sourcing of public video feeds for pricing enforcement.

Figure 16. Mobile License Plate Readers are compact portable systems to aid in pricing enforcement

- *Automated Vehicle Occupancy Detection (AVOD)* – For pricing programs such as express toll lanes with carpool discount rates, verification and enforcement of the number of occupants in vehicles has been challenging due to the need for police enforcement, limited field coverage, and the cost of enforcement. However, in recent years, multiple vendors have deployed camera vision systems to automatically identify vehicle occupants with greater confidence.
- *Autonomous Enforcement Drones* – With advancements in autonomous ground vehicle- and aerial drone- capabilities, acceptability, reliability, and costs, potential new concepts for checking transponders, vehicle types, and license plates could become more practical and cost effective than fixed tolling equipment installations.

Although Seattle could purchase one of the many back office suites that system integrators sell to process payments, handle customer accounts, and issue invoices and violations for tolling and pricing schemes, the City could also leverage one of several back offices already established in the Puget Sound region. For example, WSDOT has a back office system to support its *Good to Go!* tolling program with over 763,000 customer accounts handling over 50 million toll transactions annually. Seattle could also consider leveraging the ORCA card transit payment system, which supports over 1 million cards and approximately 450,000 daily transactions. Although the ORCA system does not currently support tolling, this could be a good option for a pricing program with multimodal incentives.

Figure 17. Example of the Swedish MaaS combined mobility program app

Another alternative would be to work with a private Mobility as a Service (MaaS) provider, such as Lyft or other ride-hailing firms. These platforms are moving toward allowing travelers to have a single account that handles payments for various transportation modes, such as car sharing, bike sharing, transit, and ride-hailing services. A MaaS platform could handle congestion pricing as another service charge and enable multimodal incentives.

Whether operated by the City of Seattle, another public agency, or a private third party, there are many advancements that can make back office systems more customer friendly. Website interfaces, apps, and artificial intelligence-powered Interactive Voice Recognition are technologies that supplement more traditional staffed customer service centers. More advanced back office systems allow payment methods beyond credit cards or bank accounts, which helps to meet the needs of unbanked customers. For example, there are payment networks that use kiosks located in grocery and convenience stores to make it easier for people to pay their chargers with cash and/or their mobile phones.

To address privacy concerns, back office systems can isolate payments and accounts from traveler location information. For example, Oregon Department of Transportation's (ODOT) OreGo road user charge program isolates traveler trip information with third party vendors, and only charged amounts are reconciled with ODOT's financial system. Additionally, some toll agencies, such as the Georgia State Road and Tollway Authority, have developed accounts that only need license plate information, bypassing the need for driver information or other identifiers.

Parking Technologies

Applies to: On-Street Parking and Off-Street Parking

Parking technologies have progressed dramatically with the introduction of electronic payment systems. Advancements in vehicle detection, payment methods, traveler information, and enforcement have improved the customer experience and operations for both on-street and off-street parking.

For on-street parking, the City is already using pay stations and a mobile payment app (Park Mobile) to make it easier for customers to pay for and track their parking use. Both of these electronic payment methods could help the City support an additional parking price for congestion reduction, although some older pay stations may need to be replaced to implement dynamic pricing. There are also other parking technologies the City could use to enable more dynamic parking pricing:

Figure 18. Siemens radar sensors can monitor parking spaces

- *Parking space detectors* – Embedded pavement sensors, video cameras, and radar detector technologies can help monitor on-street parking availability. These types of technologies could allow the City to set parking prices more dynamically and to communicate available parking spaces to reduce traffic caused by circling vehicles looking for parking.
- *DSRC* – As mentioned above, the Federal Government may mandate that vehicles built after 2023 have 5.9 GHz networking capability, which could provide another tool for monitoring parking availability. With built-in vehicle communications, the City and other DSRC-equipped vehicles could broadcast parking space and pricing information to vehicle navigation systems in real time. The City could also allow parking payments through DSRC once a vehicle is parked.
- *Autonomous vehicles* – Like DSRC, the ability for autonomous vehicles to communicate enables parking space detection, dissemination of pricing information, and parking payments. A potential future scenario might be for a traveler to select a destination and their willingness to pay for on-street parking; once the choices were made, the autonomous vehicle would do the rest. AVs could contribute to traffic congestion if they were to calculate the price of parking and decide not to park and instead continue circling.
- *Mobile license plate readers* – Instead of the City's current in-vehicle stickers, parking enforcement could be improved by using license plate-based parking, where drivers link parking payments to their vehicle license plates. With mobile license plate readers system, video cameras mounted on enforcement vehicles can automatically detect and alert parking staff to violators. This approach could increase parking enforcement efficiency, particularly if dynamic parking pricing is introduced.
- *Parking information dissemination and analytics* – Although the City currently disseminates parking information through its web-based parking map, more private sector involvement in on-street parking could improve travelers' decision making and reduce the need for parking pricing signs. Several parking information service providers, such as TomTom, provide both parking information and predictive parking availability information. The City should continue to engage the private sector on ways to share parking pricing and availability data.

For off-street parking, the electronic payment technologies market varies tremendously to reflect the wide range of parking business cases. For instance, a private gated parking garage leverages different parking technologies tied into a building security system then a non-gated public parking surface lot. Additionally, parking payment business rules vary since customers can pay for off-street parking in different ways, even in the same parking lot. For example, some people have their parking pre-paid by their employers monthly, whereas infrequent drivers might pay for their hourly parking upon exit. The many types of parking systems reflect this variance in off-street parking, which makes standardization of system interfaces and data exchange challenging.

Despite the lack of standardization, advancement in electronic parking payments can make off-street parking a more effective pricing tool. Electronic payment technologies that continue to advance include the following:

- *Point of sale system upgrades* – Many parking garages use point of sale systems and can handle added fees and taxes, so it could be possible to add a congestion surcharge. Close coordination with parking operators and vendors is needed to assess any potential pricing program, frequency of pricing changes, and communication.
- *Mobile payment applications* - Some cash-based parking facility operators may need assistance transitioning their customers to an electronic payment system and changing their pricing. A simpler electronic implementation approach could use a parking mobile app offered by companies such as ParkMobile, PayByPhone, and QuickPay, which operate off-street parking payment systems in the Puget Sound region. Similar to tolling, parking facilities could charge a higher price when customers pay with cash instead of electronically. Many cash facilities have an operational incentive to transition away from cash payment to reduce labor costs of processing cash and revenue leakage from cash handling.

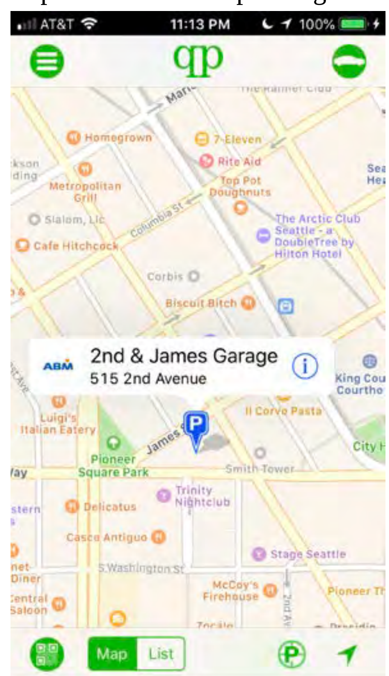


Figure 19. QuickPay app enables travelers to pay for off-street parking

- *6C Protocol Transponders* – WSDOT's *Good To Go!* tolling system uses transponders with the 6C communications protocol, and these same transponders can be used for parking garage access. For example, the toll operator E-470 in Denver partners with the Denver International Airport for parking payment and access using the ExpressToll transponders. The use of the 6C protocol in transponders is increasingly prevalent—for tolling, fleet vehicle management, and in-vehicle payment methods—because these transponders are inexpensive, allowing for wider distribution and adoption. If the City were to implement multiple pricing tools, 6C transponders could be used for both a cordon pricing and an off-street parking program, for example.
- *DSRC and autonomous vehicles* – As with on-street parking, a vehicle with the capability to communicate and/or navigate could help people make better decisions on parking options and help parking lot operations run more efficiently. For example, a DSRC vehicle linked to a payment account could be processed by a gated parking system, thereby reducing bottlenecks at garage exits and reducing the need for parking attendants.
- *Parking information dissemination and analytics* – For parking pricing to affect a person's decision to drive or use another transportation mode, the price must be effectively communicated and transparent.

Road User Charge

Applies to: Road User Charging

Although tolling and RUC share many similarities, RUC is based on charging by the total distance traveled. Therefore, deploying current tolling technology based on AVI and ALPR on every roadway would be impractical and prohibitively expensive to build and operate. However, some of the future alternative technologies discussed in the tolling section could be applied to RUC. Cell phone apps, DSRC, 5G LTE,

and autonomous vehicles are technologies that can track vehicle distance traveled. But more importantly, these technologies could help to identify when and where vehicles travel on charged (or tolled) roadways. In terms of back office technologies, RUC and tolling are very similar—they must support customer accounts and process charges—and would use similar technologies.

Privacy Considerations

Privacy is one of the chief concerns raised whenever discussing congestion pricing, whether it is tolling, road user charging, or parking.[1] Inherently, congestion pricing requires identifying a customer at a particular time and place in order to properly charge them. This introduces two primary concerns related to "Personally Identifiable Information (PII):"

- **Location Tracking:** knowing where a customer has been
- **Personal Customer Information:** details that can uniquely identify a person, such as name, address, or financial information

Models for protecting PII are already established in the larger electronic payments space, which includes tolling and transit fare cards. In particular, hundreds of toll facilities in the U.S. that use electronic toll collections have developed business practices to deal with PII regulations, which could be transferable to a broader set of congestion pricing projects. For example, WSDOT's *Good to Go!* Program has technologies and procedures in place to safeguard PII information, such as using proprietary internal identifiers, encryption, and anonymizing or aggregating travel data.

In addition, since toll operators handle credit card information, they are subject to the credit card industry's stringent security standards called Payment Card Industry Data Security Standards. Some toll operators also offer cash-based accounts that do not require customer information, further ensuring anonymity. Many toll operators also proactively educate customers on privacy issues and disclose privacy terms on customer agreements, websites, and other media. These tolling industry practices are well established and tested in court; therefore, they offer a practical roadmap for application to other types of congestion pricing tools.

Any potential pricing program in Seattle would be required to comply with the City's Surveillance Ordinance 125376, which "is designed to provide greater transparency to City Council and the public when the City acquires technology that meets the City's definition of surveillance."[2] The ordinance requires that City Council review and vote on the acquisition and use of any surveillance technologies and also stipulates community involvement and analysis of potential privacy implications, especially relating to equity and community impact.

Piloting Pricing

When considering a new technology or operational strategy, private companies and public agencies may choose to pilot the program to reduce the economic and political risk of making a significant investment.

[1] Washington State has several RCWs addressing customer privacy. The Washington Public Records Act (RCW 42.56) broadly addresses protecting public records. Specific tolling regulations cover tolling PII (RCW 42.56.330) and tolling enforcement (RCW 46.63.160).

[2] City of Seattle Surveillance Ordinance 125376: https://www.seattle.gov/tech/initiatives/privacy/surveillance-technologies/about-surveillance-ordinance

A pilot can reduce many different types of risk, but the two main sources of risk are generally the following:

- **Technological** – Does the technology supporting the program actually work? For example, does a vehicle occupancy detection technology accurately determine the number of passengers in a vehicle?
- **Program** – Do travelers actually respond to the program in the intended fashion? For example, does increasing parking prices discourage people from driving?

In order for a pilot to reduce risk, the City (or another entity) must understand what type of risk it wants to reduce and design the pilot accordingly. By its nature, a pilot is a limited test of a concept. Pilot designers can constrain the implementation of a concept by limiting the physical area of the test, limiting the number or types of participants in the pilot, or testing only a portion of the technology. If an entity (such as the City) wants to ensure that the technology works, then piloting in a limited physical space and/or piloting with volunteer participants could be an adequate test of the technology. On the other hand, if the purpose of a pilot is to test traveler response to a pricing tool, then piloting with volunteers or in a small area may skew the results; a pilot focused on a limited technological scope may be a better design in this case. Pilot design may also depend on factors including the budget, schedule, and level of coordination required with other parties, such as integration with other systems.

After accounting for the considerations above, Seattle could conduct a pilot on any of the pricing tools described in this memo, depending on the goals and circumstantial constraints. The list below describes potential pilot approaches for different pricing tools. (All program selections are theoretical for the purpose of exploring potential pilot program designs.)

- *Cordon/area pricing with cell phone app* – In this example, Seattle has required all vehicles travelling within a certain zone to have an app that determines when the vehicle travels into the priced zone. Seattle could conduct a pilot to demonstrate that the app can accurately determine when the vehicle is in the priced area. This pilot would be limited in both geography and in the number of travelers with the app downloaded to their phones. Enforcement could be done with strategically placed mobile license plate readers to identify violators. The priced area could be small to start and then gradually expand beyond the pilot.
- *FFFZ, LPRZ, and C/AV only with police and mobile ALP* – In this pilot, Seattle could combine restrictions to certain vehicle types, license plate numbers, or clean air vehicles to lessen the traffic disruption impacts caused by prohibiting other vehicles. Enforcement could be handled by police and/or strategically placed mobile license plate readers to identify violators. Violation fees could be used to offset operational and program costs. Restrictions to vehicles could start with a small area and focus first on an end license plate number on certain week days. The pilot could then introduce more vehicle type restrictions, prohibit more license plate numbers, and expand the restricted area over time.
- *Vehicle fleet with transponders* – As a proof-of-concept pilot, the City could price an area with heavy vehicle fleets, such as intersections near industrial areas. Then the program could expand to TNCs traveling through congested downtown intersections.
- *Road User Charge* – Seattle could engage the Washington State Transportation Commission to jointly pursue USDOT funding under the Surface Transportation System Funding Alternatives (STSFA) grant program.
- *On-street parking* – Seattle could modify parking systems in downtown to dynamically vary parking rates. The City could also pilot different parking sensor technologies to verify availability of street parking in real time.

- *Off-street parking* – The City could pilot a pricing surcharge in Seattle's ePark program parking garages. The technology that tracks space availability could be used to set parking congestion prices. More importantly, the ePark website enables travelers to see parking prices in real time before starting their trip, instead of relying on a sign board when arriving at their destination. To expand the pilot, the City could engage private lot operators and provide subsidies for system upgrades (funded by the ePark surcharge).

Legal Implications of Pricing Tools

Along with weighing the relative advantages and disadvantages of each pricing tool, the City will need to evaluate pricing tools in the context of federal, state, and local legislation and regulations. These legal considerations can have a significant impact on the difficulty of implementing a particular tool or set of tools. This section takes a high-level look at existing laws and regulations that apply to each tool. As the City narrows the tools under consideration, a more extensive review of preferred tools will be required. The level of regulatory change needed may also depend on Seattle's coordination with other government entities, such as the WSDOT and the Federal Highway Administration. Current laws and regulations related to pricing may affect the City's authority to implement a pricing tool; constrain how the City can implement a pricing tool; and impact enforcement effectiveness.

A review of the Revised Code of Washington (RCW) and Washington Administrative Code (WAC) as well as Seattle's Municipal Code points to laws and regulations that may apply to various pricing approaches. (Appendix A contains links to the material reviewed to inform this section.) A summary of the ways the legal framework for tolling, parking, and vehicle fleet restrictions may impact the various tools is below.

Tolling Vehicles

Applies to: Cordon Pricing, Area Pricing, Fleet Pricing, Road User Charge, Arterial Toll Roads, and Arterial Express Lanes. (May apply to: Connected/Autonomous Vehicle Zone, Fossil Free Fuel Zone, and License Plate-Based Restriction Zone)

For tools that depend on the collection of tolls, RCW 36.03.040 establishes the right of the Seattle Transportation Benefit District (STBD) to charge "vehicle tolls on state routes, city streets or country roads within the boundaries of the district unless otherwise prohibited by law." Further, RCW 36.73.065 states that, "tolls may not be imposed by a district without approval of a majority of the votes in the district voting on a proposition at a general or special election."

Tolling a state route is more complex—RCW 47.56.820 requires that the state legislature must first authorize the tolls on such roads. That same law states that WSDOT and the Washington Transportation Commission may have a role in setting and collecting tolls on any road depending on the proposed toll's impact on state transportation plans; this is formalized in Chapter 468-270 (WAC). Thus, although the STBD has the authority to toll, it would need to coordinate with WSDOT and the Transportation Commission to implement any tool involving tolls. The RCW does not specifically address the authority to impose tolls in the form of area pricing or fleet restrictions, so these tools would require additional legal analysis.

Since any use of pricing to manage congestion depends on vehicles actually paying the assigned fees, enforcement is vital. RCW 46.63.160 allows WSDOT to issue Notices of Civil Penalty to people who do not pay their tolls. The law specifically cites WSDOT's right issue these notices, not any other tolling entity. This suggests that the City of Seattle would either need to work with the state to pass new legislation or coordinate with WSDOT to have all tolls processed through that agency.

Parking Pricing

Applies to: On-Street and Off-Street Parking

Seattle is already exercising its authority under City Ordinance 11.76.015 to charge parking fees on city streets and parking facilities. Municipal Code 11.31.121 lays out penalties that the City may charge for all types of parking infractions, including failure to pay parking fees. If the City were to implement a more complex dynamic pricing structure and charge drivers directly, the ordinances that authorize these parking fees may need to be revised.

Vehicle Fleet/Class Restrictions

Applies to: Connected/Autonomous Vehicles Zone, Fossil Free Fuel Zone, Arterial Express Lanes, and License Plate-Based Restriction Zone

Several of the potential pricing tools would require the City to limit access to certain geographic areas for certain vehicle types. The City of Seattle does have the right, under City Ordinance 11.16.280, to create special zones, such as pedestrian zones and car sharing zones. However, roads under WSDOT's jurisdiction would need laws and regulations to allow such restrictions to be imposed. Using cameras to enforce these zones with automatically-issued tickets, would require legislation similar to City Ordinance 11.50.570 for automated traffic safety cameras. Seattle's legal powers to use cameras for enforcement is subject to restrictions imposed by the Washington State Legislature.

Appendix A

The following are relevant links to statutes and codes for pricing:

1. Transportation Benefit Districts - RCW 36.73.040 - Specific language on tolling city streets
   http://app.leg.wa.gov/RCW/default.aspx?cite=36.73.040
2. Transportation Benefit Districts – RCW 36.73.065 - Election needed to impose a toll
   http://app.leg.wa.gov/RCW/default.aspx?cite=36.73.065
3. State Toll – RCW 47.56 – Tolling of State Highways
   http://app.leg.wa.gov/RCW/default.aspx?cite=47.56
4. Setting toll amount – WAC 468-270 – Setting tolls on toll facilities
   http://apps.leg.wa.gov/wac/default.aspx?cite=468-270
5. Toll enforcement - RCW 46.63.160 – Photo enforcement and civil penalties
   http://app.leg.wa.gov/RCW/default.aspx?cite=46.63.160
6. Parking – Title 11, Part 1, Chapter 11.76 – Parking payments
   https://library.municode.com/wa/seattle/codes/municipal_code?nodeId=TIT11VETR_SUBTITLE_ITRCO_PT7STSTPALO_CH11.76PAPADEOP_11.76.015PAVIBLPOTHREPAPA&showChanges=true
7. Parking enforcement – Title 11, Part 1, Chapter 11.32.280 – Parking enforcement and issuance of violations
   https://library.municode.com/wa/seattle/codes/municipal_code?nodeId=TIT11VETR_SUBTITLE_ITRCO_PT3EN_CH11.32CI_11.32.080RECI&showChanges=true
8. Special Zones – Title 11, Part 1, Chapter 11.16.280 – Creation of special traffic zones
   https://library.municode.com/wa/seattle/codes/municipal_code?nodeId=TIT11VETR_SUBTITLE_ITRCO_PT1GEPRAD_CH11.16TRAD_11.16.280TRENUTPEZO
9. Seattle Surveillance Ordinance 125376 – Requirements related to surveillance technologies
   https://seattle.legistar.com/LegislationDetail.aspx?ID=2981172&GUID=0B2FEFC0-822F-4907-9409-E318537E5330&FullText=1

DRAFT CONGESTION PRICING IMPACTS AND BENEFITS WHITE PAPER

INTRODUCTION

The purpose of this white paper is to provide a high-level description of what is currently understood about the potential impacts and benefits of implementing a congestion pricing program in Seattle. It begins with baseline conditions data, describing local and regional travel patterns that could be affected by congestion pricing. It discusses some of the programs already in place to reduce travel demand in congested areas and during congested times. The paper then reviews lessons learned from evaluating mobility pricing efforts in Seattle and around the world.

The remainder of the paper is dedicated to the high-level evaluation of select mobility pricing tools, focusing primarily on area pricing, as the evaluation of select impacts and benefits can be accomplished with readily available data. The paper also describes data still needed and proposed methods for further evaluation of additional pricing tools.

BASELINE CONDITIONS

Both within the City of Seattle and the central Puget Sound region, travel patterns are heavily oriented to Seattle's center city area. Each weekday, approximately 250,000 people travel to or through central Seattle, approaching from the north (91,000), east (64,000), south (70,000), and west (24,000).[1] Commute patterns within Seattle are also heavily oriented to the center city. Figure 1 shows commute flows between Puget Sound Regional Council (PSRC) forecast analysis zones (FAZs) using 2015 Longitudinal Employer Household Dynamics (LEHD) Origin-Destination Employment Statistics (LODES) data.

While commute trips into center city originate from all parts of Seattle, the residential density of center city workers is greatest in census blocks in or near the downtown core (see Figure 2).

The concentration of employment in Seattle's center city leads to traffic congestion on local and regional roadways, as shown in Figure 3 and Figure 4.

[1] City of Seattle traffic data from 2016 and 2014 for arterials and WSDOT 2017 data for state roads and freeways

Figure 1 Commute Flows within the City of Seattle

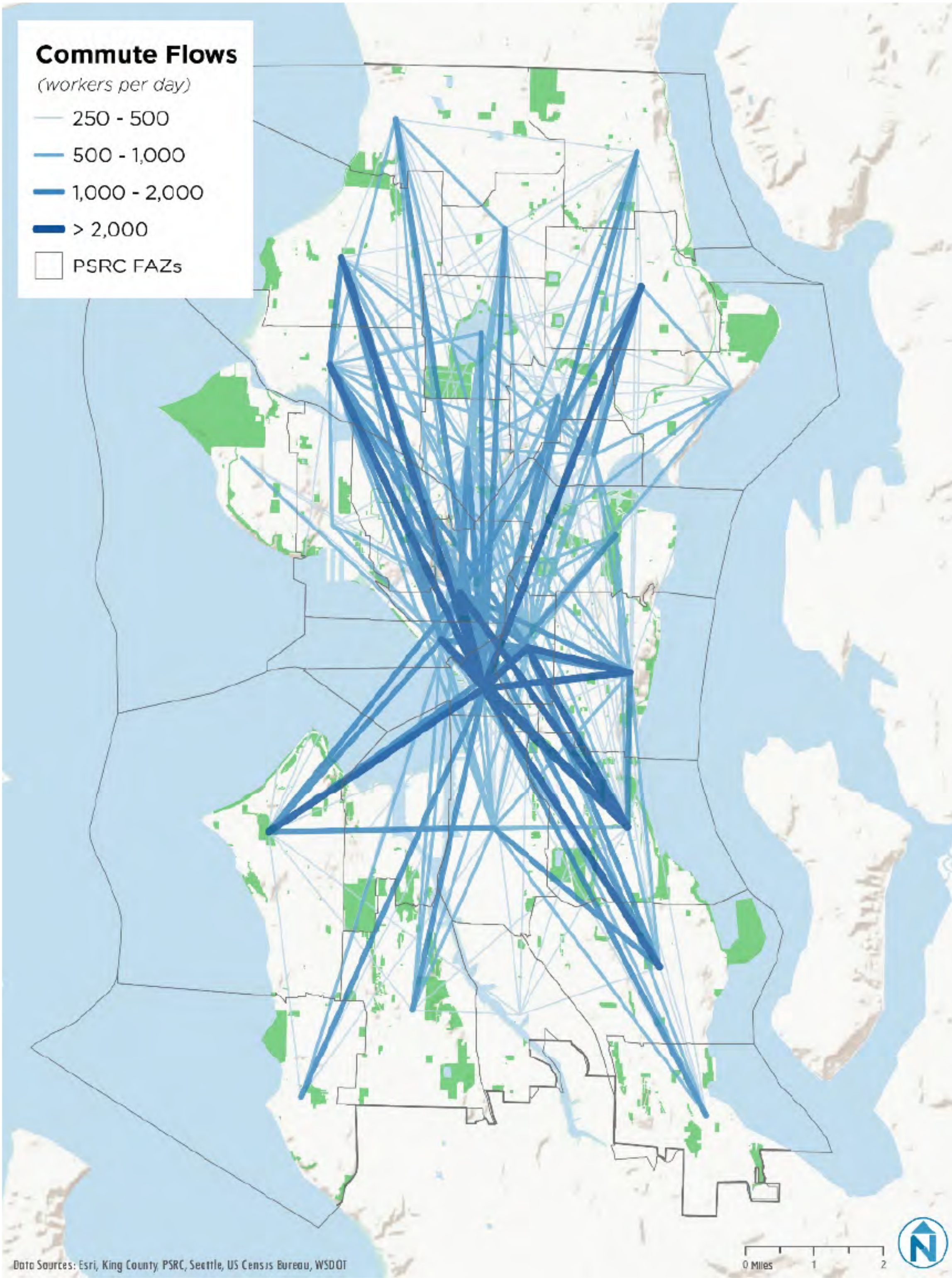


Figure 2 Residence Areas of Workers Employed in Center City

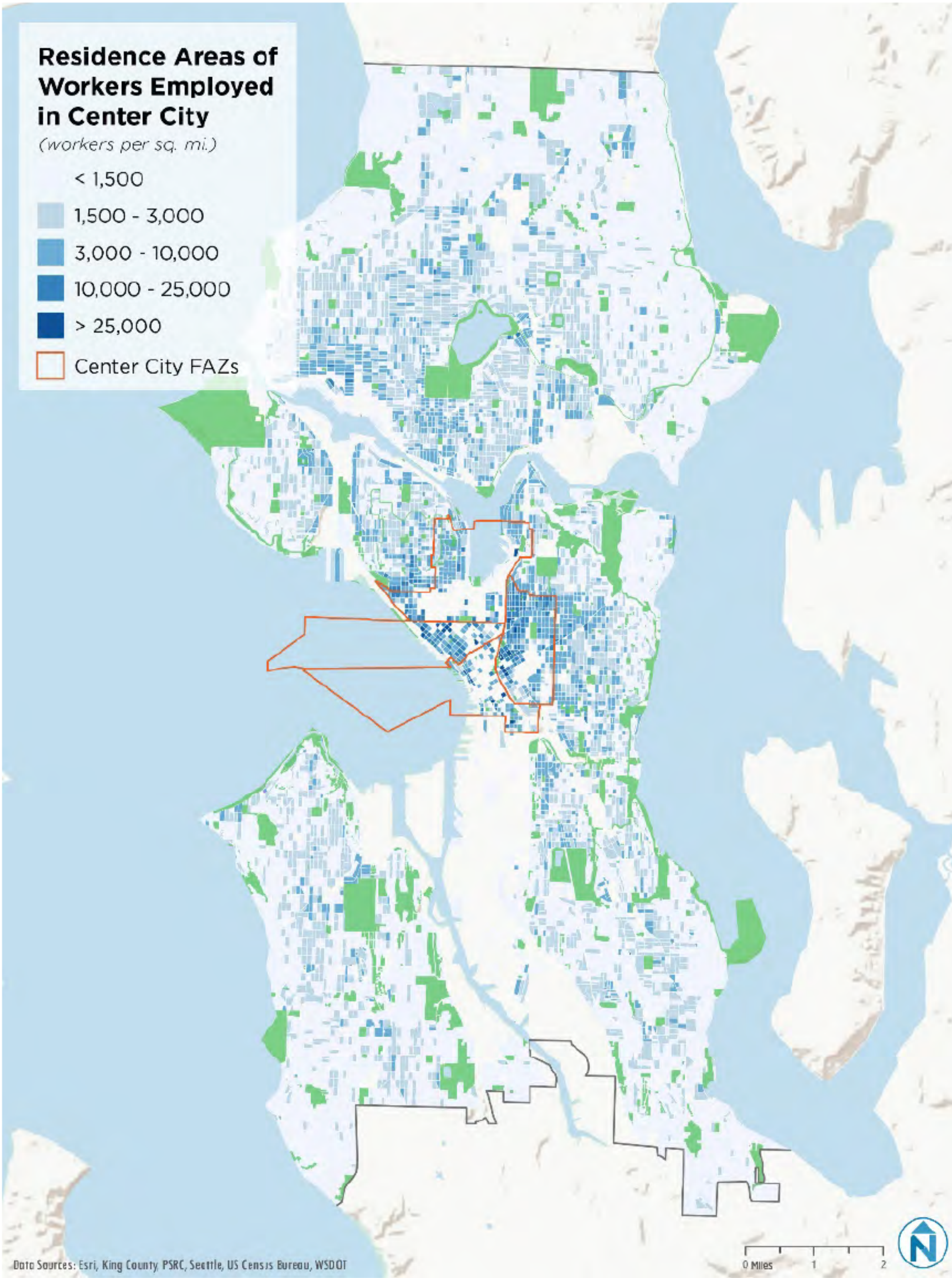


Figure 3 Average Annual Weekday Traffic on Seattle and Area Roadways

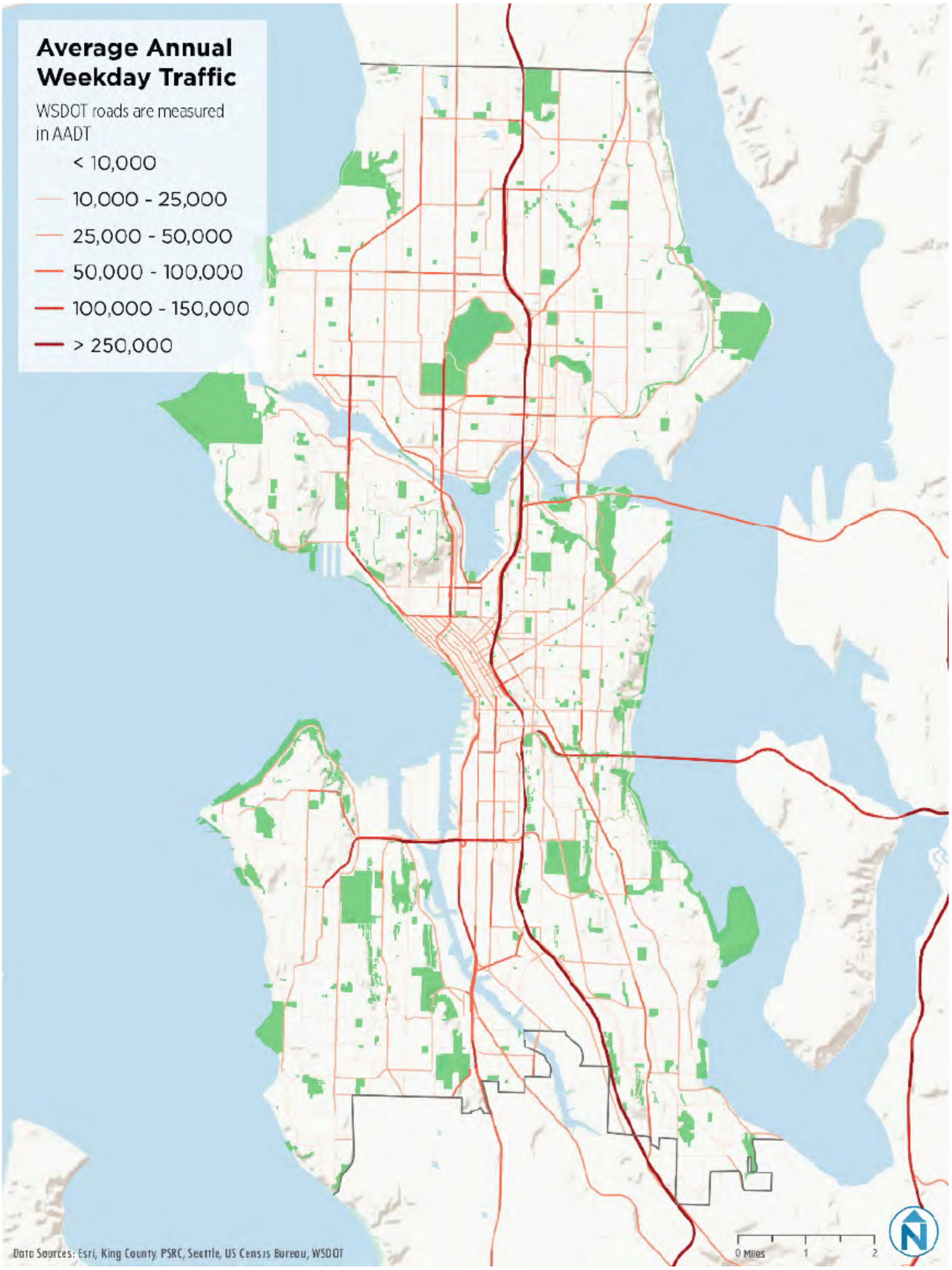
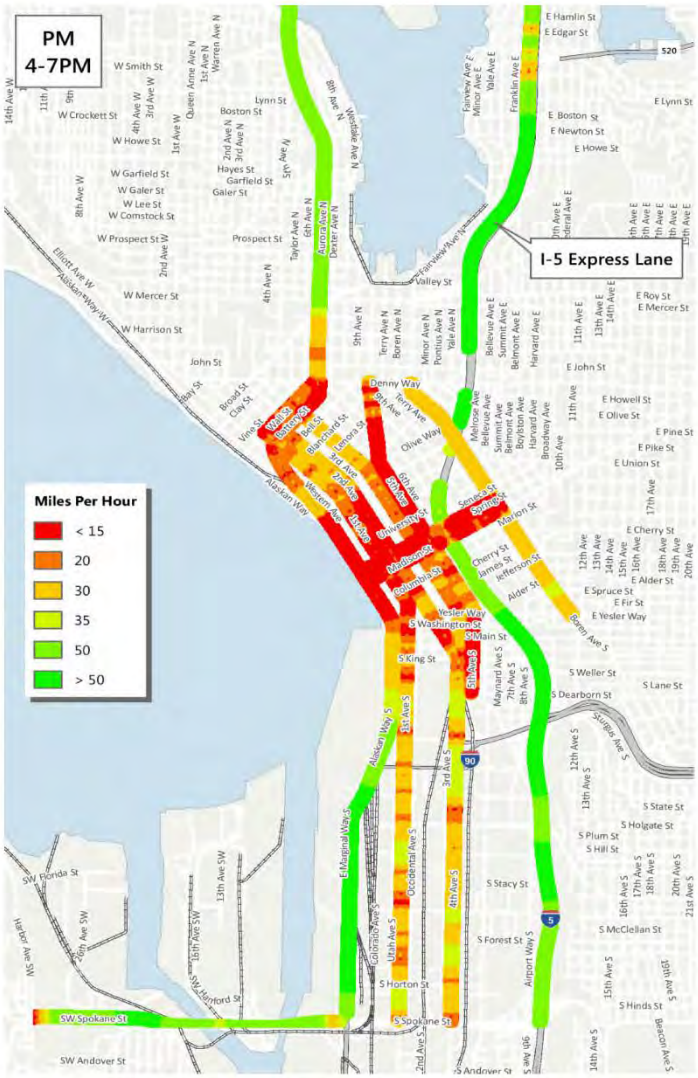


Figure 4 Travel Speeds Leaving Downtown Seattle (PM Peak)



Source: WSDOT SR-99 Tolling Study

Public Transportation Access

While the region's public transportation network is also heavily oriented toward the center city, with significant amounts of weekday peak-period commuter service from throughout the region into (or out of) downtown, there are areas of opportunity for better connections to center city employment and activities, especially in terms of creating a more equitable system.

Figure 5 shows low-income household density in Seattle, overlaid with the existing and future frequent transit network. Most areas with a higher density of low-income households have access to frequent transit service, though some gaps remain. An interesting comparison is provided by Figure 6, which shows density of zero-vehicle households in Seattle (again with the frequent transit network overlay). This figure suggests that low-income households are not a proxy for zero-vehicle households, with many higher density areas of low-income households having lower zero-vehicle rates. Zero-vehicle households appear to be more closely associated with proximity to

the center city and the University of Washington, areas that have both priced and/or limited parking options and abundant transit service. This is relevant to the evaluation of congestion pricing impacts and benefits because it suggests that low-income residents to the north and south of downtown Seattle are owning vehicles out of necessity and therefore may experience greater negative impacts due to the pricing of roadways or vehicle use.

Figure 5 Low-Income Households and Frequent Transit Network in Seattle

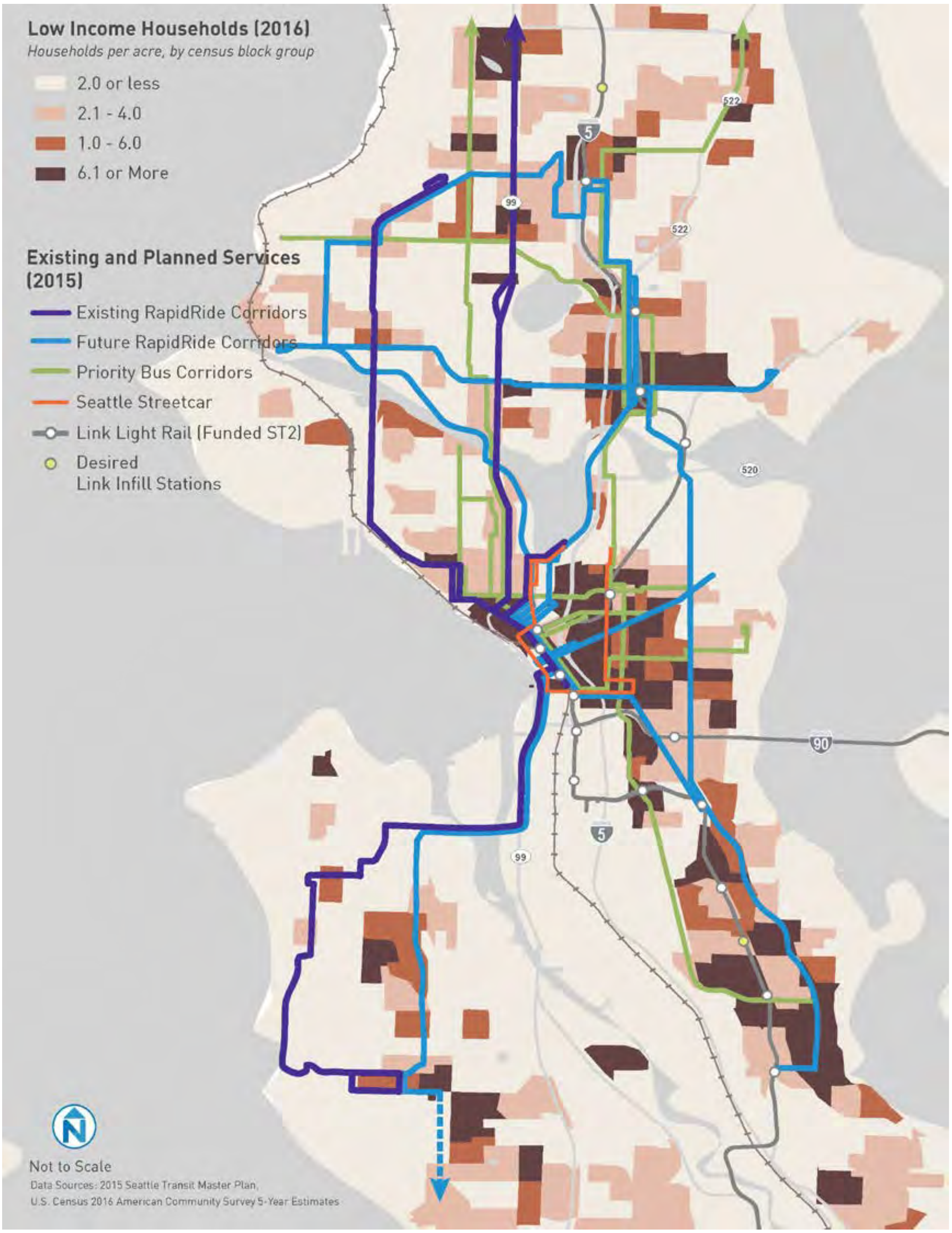
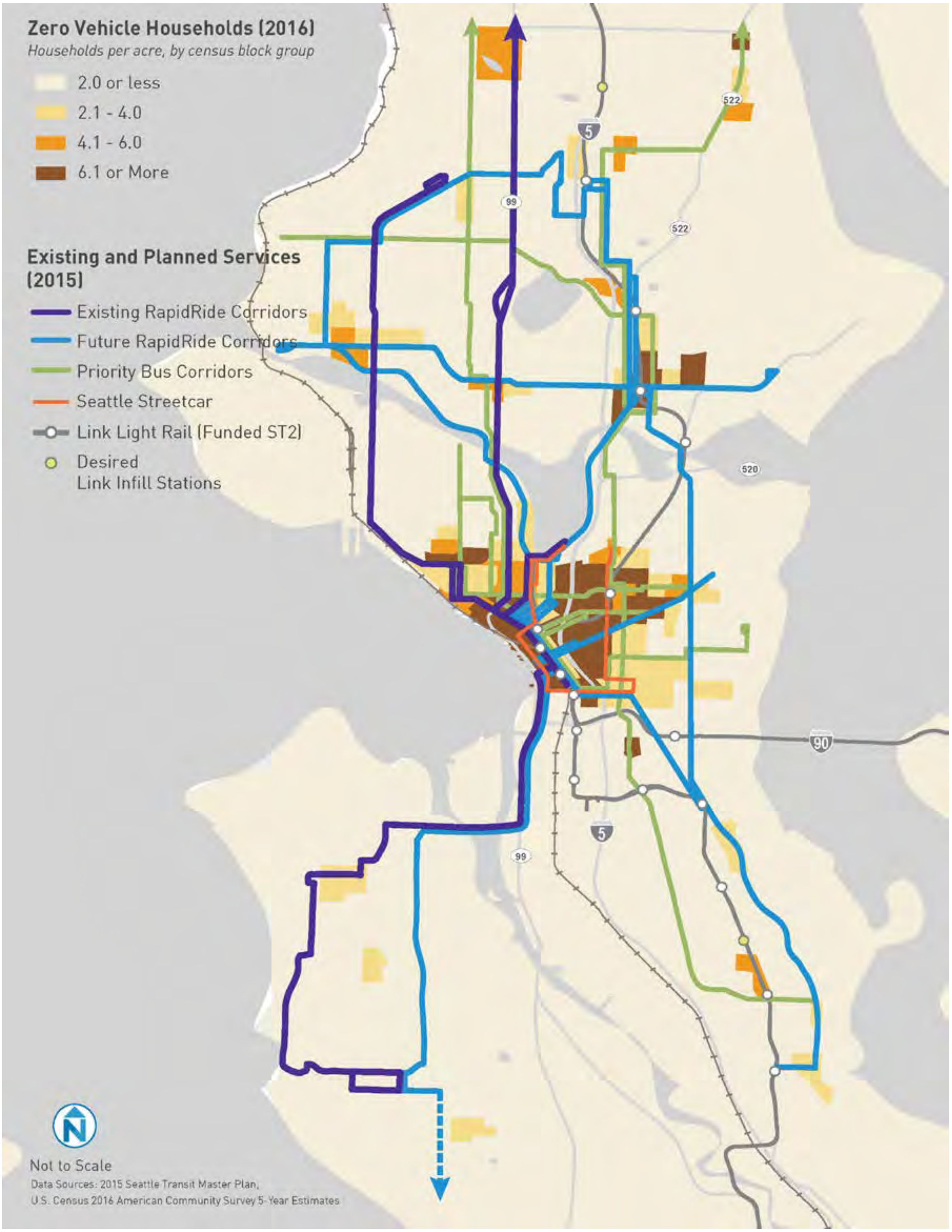


Figure 6 Zero-Vehicle Households and Frequent Transit Network in Seattle



TRANSPORTATION EQUITY

As discussed in the Pricing and Equity White Paper, historical transportation policies and investments have helped to create and uphold racial and social inequalities by favoring those with the resources to own and operate private vehicles. The City of Seattle is considering congestion pricing as a tool to help address climate change, and also as a tool that can help to make the transportation system more equitable by using new revenues to provide people with additional options other than driving alone (such as improved transit service). This study comes in the wake of successful efforts by the City and region to improve transit access and internalize some of the private costs of transportation through the following programs:

- **Parking and curb space policies:** Seattle is a leader in parking pricing and management of high-demand public right-of way including curb space and on- and off-street parking.
- **Transportation demand management:** Seattle's employer commute trip reduction efforts have led to a 10% decrease in drive-alone mode share and corresponding increases in transit and active commute modes to center city jobs between 2010 and 2017.[2] The citywide drive alone rate has decreased by 5% over the same period.
- **Seattle Transportation Benefit District:** In 2014, Seattle voters chose to fund additional transit service and other transit programs in Seattle, helping to contribute to increased transit service and higher transit ridership throughout the city.
- **ORCA LIFT and ORCA Opportunity Programs:** In 2015, King County Metro, Sound Transit, and other regional transit providers implemented a low-income fare rate available on the regional fare card, One Regional Card for All (ORCA), called ORCA LIFT. The program offers reduced fares for people whose household income is less than double the federal poverty level. Seattle also implemented the ORCA Opportunity program (formerly Youth ORCA program) to provide free ORCA passes to high school students at Seattle Public Schools.

The evaluation of congestion pricing tools continues Seattle's efforts to create a more equitable transportation system. The Pricing and Equity White Paper recommends approaches that can be taken to ensure that community voices are included in the discussion, with a goal that any recommended congestion pricing program improve rather than exacerbate inequalities in the transportation system.

LESSONS FROM LOCAL AND INTERNATIONAL MOBILITY PRICING EFFORTS

This white paper does not provide a full evaluation of lessons learned from other cities' mobility pricing studies and programs; rather, it identifies high-level evaluation methodologies used elsewhere to inform SDOT's understanding of potential impacts and benefits of various pricing programs. A key finding of this best practices scan indicates that when cities and regions have evaluated potential congestion pricing impacts and benefits, they have conducted and documented their evaluation using resource-intensive modeling of well-defined pricing programs. Other findings relevant to this phase of Seattle's evaluation are presented below.

[2] 2017 Center City Commuter Mode Split Survey Results

The Washington State Department of Transportation (WSDOT) will collect a toll on SR 99 through downtown Seattle when the tunnel opens (expected early 2019). WSDOT conducted a tolling study to determine toll rates and impacts of the newly-tolled facility, which is useful for this Congestion Pricing Study analysis. The WSDOT tolling analysis focused on achieving two goals: 1) minimize diversion and 2) meet the minimum revenue target. While income was considered in the diversion rate—assuming that lower-income drivers would be more price-sensitive and likely to change behaviors to avoid a toll—equity was not an explicit evaluation metric. A pricing program on downtown roads could mean that low-income drivers would be faced with no non-priced alternative routes.

Vancouver, BC conducted a high-level screening of pricing tools that reflected the goals and objectives that the region determined should be achieved by a mobility pricing program. The high-level screening approach discussed in the next section is based on Vancouver's example.

For additional lessons learned from mobility pricing efforts in other areas of the country and world, refer to the Pricing Tools, Equity and Pricing, and Messaging Best Practices White Papers.

PRICING TOOLS SCREENING APPROACH AND OUTCOME

Earlier in this study, the project team identified nine potential pricing strategies for Seattle to consider as part of a congestion pricing program. These were screened through a simple process designed to prioritize the most promising congestion pricing strategies for further study and refinement. The screening was informed by SDOT's preliminary goals and desired outcomes, the six key steps to pricing referenced in the companion Pricing and Equity White Paper, and implementation considerations.

Through the screening process, four pricing tools were recommended for further analysis. These tools are:

- **Cordon pricing:** Charge vehicles crossing the boundary into a designated zone
- **Area pricing:** Charge vehicles both crossing the boundary and driving inside a designated zone
- **Fleet pricing:** Apply targeted pricing to specific vehicle types, such as ride-hailing fleets or commercial vehicles; this can be applied within a designated zone or citywide
- **Road user charge (RUC):** Charge all vehicles for use of the roadway OR restrict access to a zone to vehicle enrolled in a RUC program

The Pricing Tools and Screening White Paper describes the screening process and rationale in greater detail.

HIGH-LEVEL IMPACTS AND BENEFITS ANALYSIS

This high-level impacts and benefits analysis uses readily available data to evaluate what impacts the four pricing options might have on different groups currently using the system. It also informs an understanding of the additional data needed to complete further analysis. The majority of the analysis focuses on area pricing. In the absence of well-defined pricing strategies (including specific geography, time, and fee schedule), area pricing serves as a proxy for both cordon pricing and a road user charge since both likely would include a charge for vehicles using a zone similar to the one assumed for Area Pricing in the following analyses.

Area Pricing: Impacts to Vehicle Trip-Makers

This section describes the findings from a preliminary evaluation of impacts of an area-based congestion pricing program on those making vehicle trips that would be affected by the pricing program. The analysis uses three publicly-available datasets and two similar pricing structure assumptions to estimate the impacts of such a program on people of color and low-income populations in Seattle, the Puget Sound region, and Washington state.

The primary findings of the analysis are:

- Auto trip-makers who are people of color may be—by some measures—disproportionately affected by a congestion pricing program.
- Higher-earning auto trip-makers are likely to be disproportionately affected by a congestion pricing program.
- Within the Puget Sound region and Seattle, white workers are likely to be disproportionately affected by a congestion pricing program.

The results of these analyses suggest that a zone-based congestion pricing program could have some inequitable impacts to people of color but—by and large—would cost wealthier, white drivers more than drivers who are low-income or people of color.

Methods

This equity analysis uses three primary sources of data:

- 2017 Puget Sound Regional Council (PSRC) Household Travel Survey
- 2016 Five-Year American Community Survey (ACS)
- 2015 Longitudinal Employer-Household Dynamics (LEHD) Origin-Destination Employment Statistics (LODES)

These datasets were used to produce two distinct analyses. The first analysis estimates the quantities and qualities of PM peak hour trip-makers that would be affected by a congestion pricing program, based on PSRC travel survey data for all trip types. The second analysis uses LODES and ACS data to estimate quantities and qualities of workers living or working in a potentially priced zone, which proxies as a measure of commute trips.

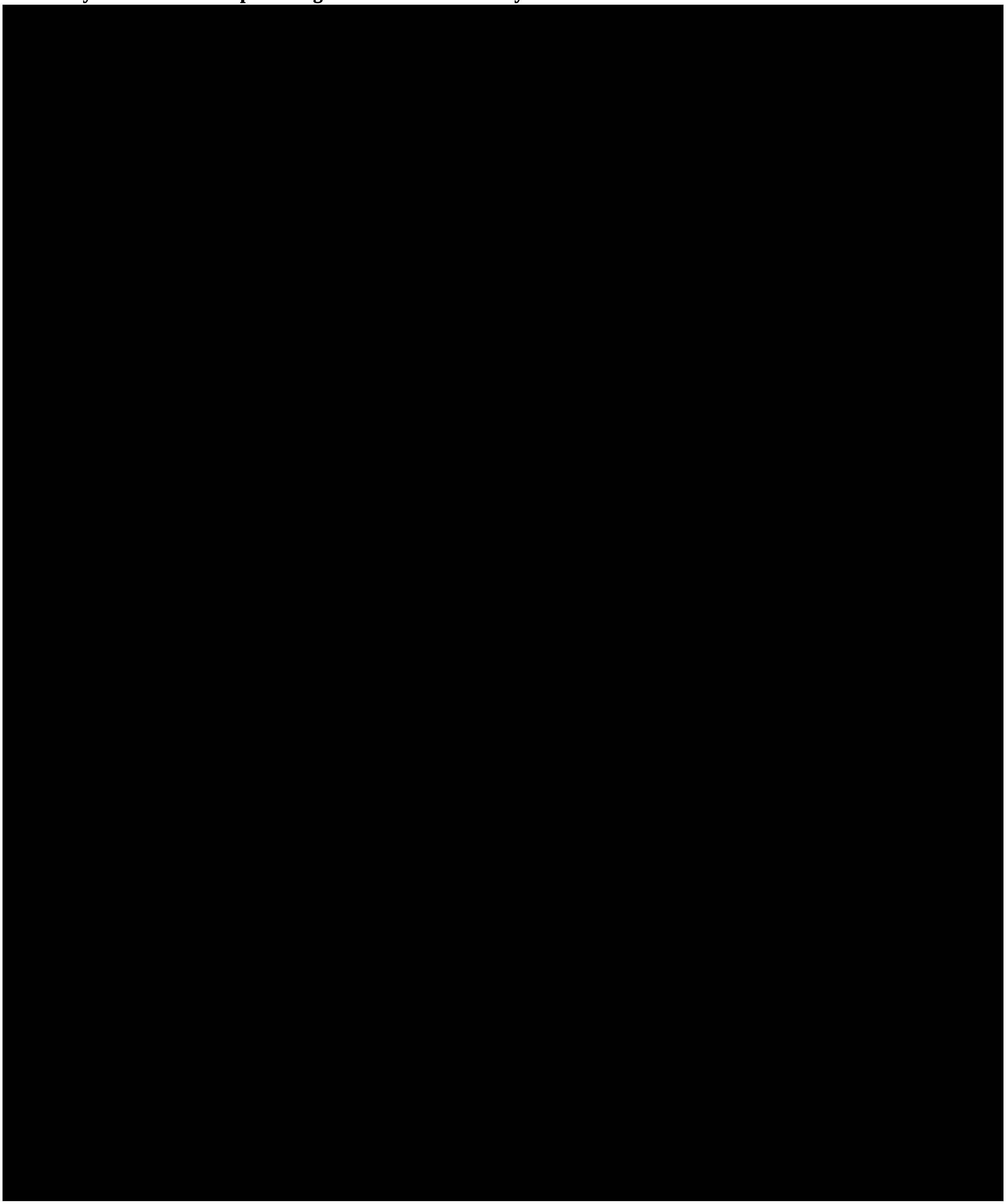
The potentially priced zone used in this analysis includes 25 distinct Census block groups[3], which are shown as a single polygon in Figure 7. This geography straddles I-5 and SR 99 and includes areas that could be considered outside the center city. These areas were intentionally included to increase sample sizes and produce conservative analyses that err on the side of over-estimating priced trips.

[3] Block groups were used because the lowest-level geography provided by PSRC travel survey data is the block group.

Figure 7 Potential Pricing Zone Used in this Analysis

[redacted]

Analysis One: All Trips Using PSRC Travel Survey



[redacted]

Analysis Two: Worker Home and Job Locations Using LODES and ACS

The second analysis used 2015 LODES data (which consist of home-workplace pairs for jobs at the Census block level) to estimate commute travel affected by a congestion pricing program. These data include a far greater sample size (nearly all jobs[7]) than the PSRC travel survey data, but the analysis relies on the assumption that workers travel from their home to their workplace as a commute. Other assumptions inherent to a LODES-based analysis include:

- Workplaces in the data represent the physical location of the workers' employment activities (workers may, for example, have an office in Seattle but work in Bellevue)
- Current spatial patterns of employment are similar to those reported in 2015
- Workers live at their reported address (workers may, for example, have their permanent residence in Ellensburg but stay with family in Seattle during the work week)[8]
- Workers commute during times of the day that a pricing program would be active

To determine which workers would be affected by an area-based congestion pricing program, those with workplaces or residences located within the potential pricing zone were first flagged as potentially priced. ACS data was then used to find the percentage of commuters traveling to work in a car, truck, or van (variable B08006_002) in each Census tract. Each block was then assigned this percentage to produce a number of workers that would be affected by pricing.

Jobs in LODES data are included in one of three distinct monthly earning categories: less than $1,250, $1,250 to $3,333, and greater than $3,333. This categorization was used to estimate the difference in impacts on various worker income groups. ACS data for drive-alone commute rates by race/ethnicity in each census tract[9] (variable B08105A_002) were then applied to the priced trips from each block to determine the difference in impacts on various groups. All racial/ethnic groups other than "white alone" were considered people of color for this analysis.

[redacted]

[7] LODES data include all unemployment insurance-covered jobs and many federal government jobs. Job types that are not included are FBI, DEA, ATF, Secret Service, USPS, CIA, and others. For a more complete list of job types that are not included, see <https://lehd.ces.census.gov/doc/help/onthemap/FederalEmploymentInOnTheMap.pdf>

[8] This analysis does not include workers that live outside the state of Washington.

[9] ACS data were collected at the tract level and assumed to be spatially consistent across all internal blocks because ACS data at the block group level have far larger margins of errors.

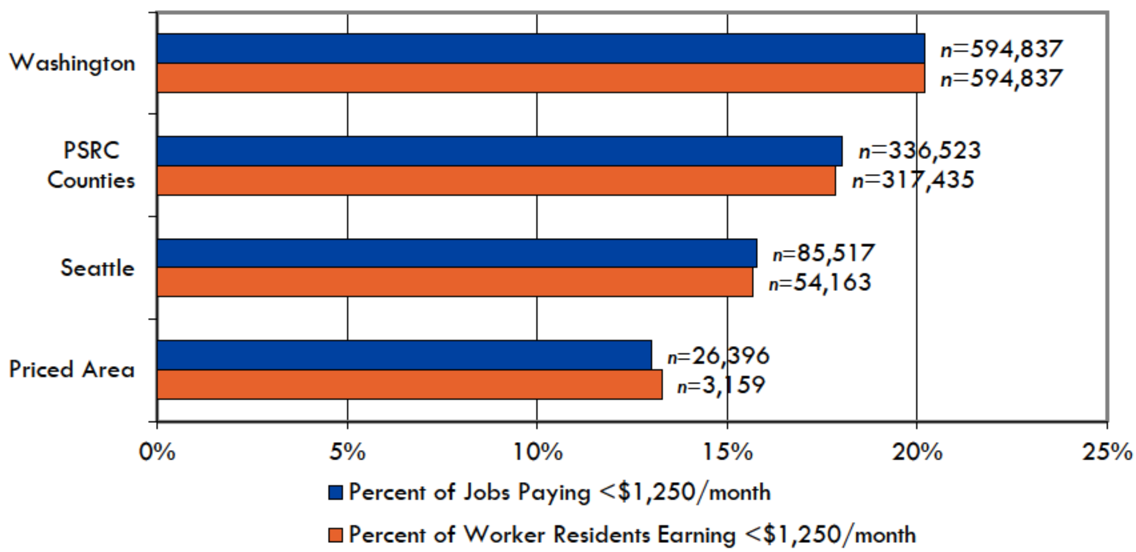
LODES data were also used to produce simple estimates of the types of jobs in the potential pricing zone relative to other geographies.

Results

This section presents the results of the analyses described above. As context, Figure 9 and Figure 10 show relevant percentages of lower- and higher-earning employment by geography. These percentages, which are based on LODES data, show that as the geography narrows to the center city potentially priced zone, the percentage of higher-earning jobs and worker-residents increases, while the percentage of lower-earning jobs and worker-residents decreases. This suggests that, at a very broad level, an area-based pricing program focused on center city would impact a greater number of higher-earning workers than lower-earning workers.

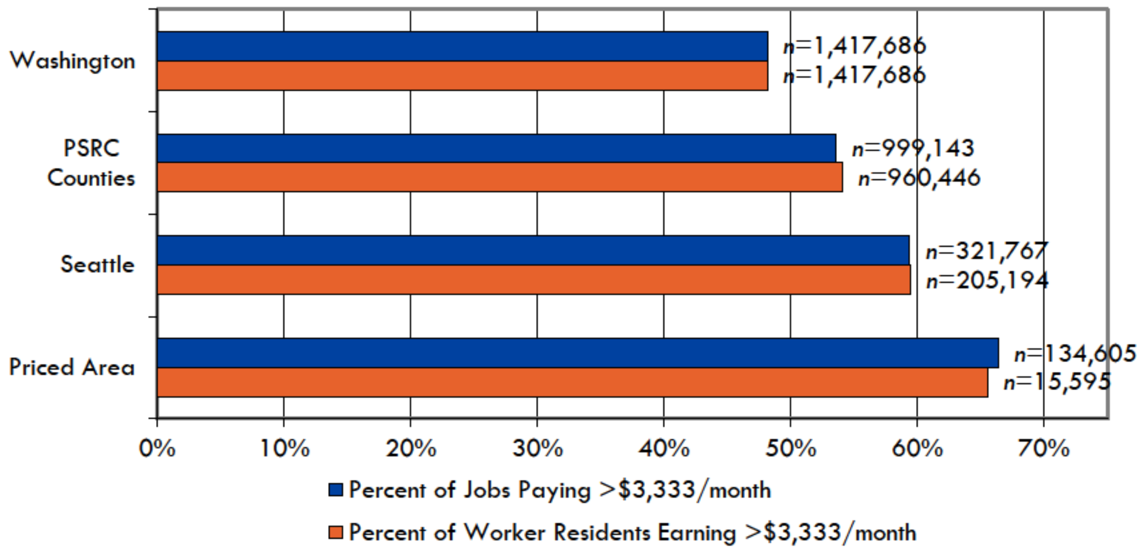
In both Figure 9 and Figure 10, the *n*= data labels indicate the number of jobs or worker-residents.

Figure 9 Lower-Earning Employment by Geography[10]



[10] PSRC counties are King, Kitsap, Pierce, and Snohomish counties.

Figure 10 Higher-Earning Employment by Geography



[redacted]

[11] PSRC. Draft Final Report: 2017 Puget Sound Regional Travel Study. P. 37. <https://www.psrc.org/sites/default/files/psrc2017-final-report.pdf>

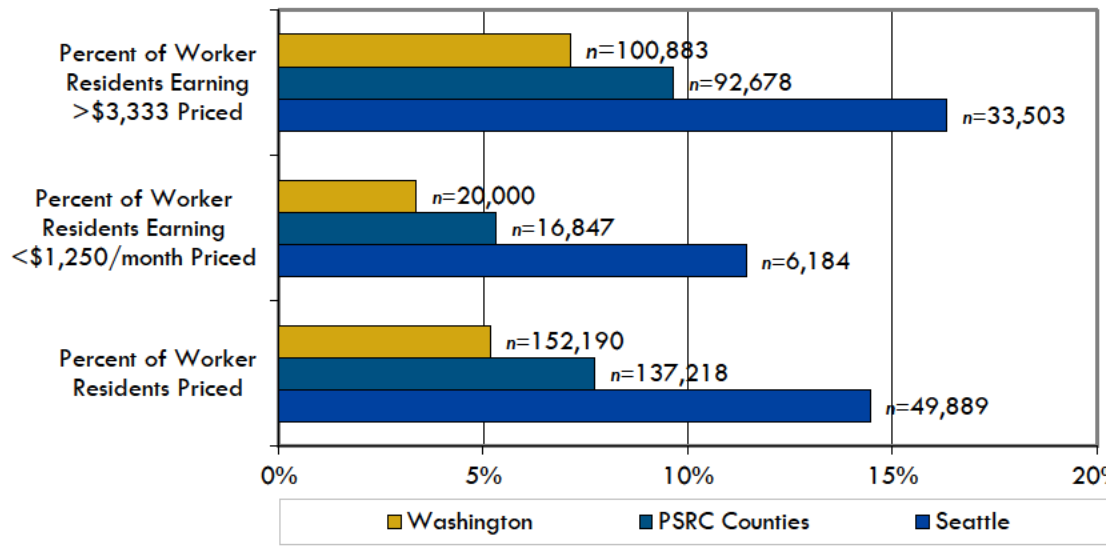
[redacted]

[redacted]

Analysis Two: Worker Home and Job Locations Using LODES and ACS

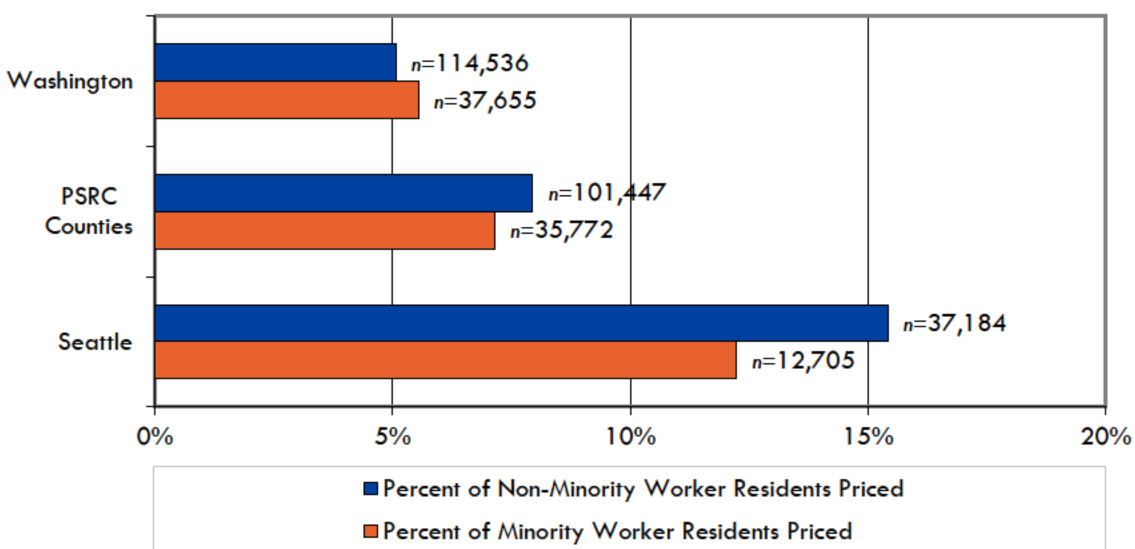
The results presented in Figure 13 show that, across all tested geographies, higher-earning worker residents are more likely to be impacted by a congestion pricing system than lower-earning worker residents.

Figure 13 Percentages of Priced Worker Resident Earning Types by Geography



The results presented in Figure 14 show that white workers living in Seattle and PSRC counties are more likely to be charged by a congestion pricing system than non-white worker residents. At the state level, racial minority (people of color) worker residents are more likely than white worker residents to be charged.

Figure 14 Percentages of Priced Worker Resident Race/Ethnicity Types by Geography



Area Pricing: Impacts to Transit Riders and Service

This section summarizes the results of a high-level analysis of the potential impacts and benefits of area pricing on transit riders and service. The primary findings of the analysis are:

- Both transit riders and operators could see significant benefits from an area pricing program in Seattle.

- Savings in transit travel time could fund additional transit service and accommodate some of the additional demand generated with implementation of a congestion pricing program.

Methods

This analysis estimated cumulative travel time savings for transit riders and transit operators in the presence of an area pricing program. To calculate the time savings for transit riders, the following equation was used:

Cumulative time saved (person minutes)	=	Transit vehicle trips	x	Travel time savings (minutes/trip)	x	Average vehicle load (people/vehicle)

The assumptions for each element of the equation are as follows:

- **Transit Vehicle Trips:** Transit vehicle trips include fixed-route bus service that travels through or within the potentially priced area (Figure 7). The analysis uses the number of trips operated by King County Metro (Metro), Sound Transit, and Community Transit in October 2018 during the weekday afternoon peak hour (4:30-5:30 PM). Three potential peak hours of service were evaluated; this hour was selected because it includes the greatest volume of transit trips starting or ending in the potentially priced area, compared to 4:00-5:00 PM and 5:00-6:00 PM.
- **Travel Time Savings:** Transit trips take an average of 37 minutes[12] to traverse the assumed pricing zone from north to south during the weekday PM peak hour. Based on travel time savings observed in cities with congestion pricing programs in place, an estimate of 15% travel time savings, or six minutes, was assumed for transit trips included in the analysis.
- **Average Vehicle Load:** To calculate average vehicle load, the project team used an assumed mix of current fleet types and capacities:

Vehicle type	50% of standing + seated capacity	Assumed proportion of fleet
40' standard coach	38.0	45%
60' articulated coach	56.5	45%
Double–decker coach	48.5	10%
Average vehicle load	48.0	

The average vehicle load is a composite of the fleet makeup and an assumption that vehicles are carrying half of their standing plus seated capacity while in the priced zone. The load value is based on the assumption that most vehicles start empty when they begin their trip in or near the edge of the potentially priced area. By the time they leave the area, most vehicles are at or near capacity during the PM peak hour. It is assumed that passenger boardings are distributed evenly through the priced zone and reach their maximum loads just prior to departing the zone. Thus, the average load during the trip

[12] Google Maps Navigation estimates 26-48 minutes (average: 37 minutes) for a transit vehicle to cross Seattle's Center City by transit, north to south, when departing on a weekday (Monday, 10/8/2018) during transit's PM peak hour (4:45 PM). This trip time reflects both a base time for a bus to cross the Center City, and additional time due to daily traffic delay.

through the zone is half of the average vehicle's (standing plus seated) capacity, or about 48 people.

Transit vehicle time savings is calculated using a similar equation, leaving out vehicle loads.

Cumulative time saved (vehicle minutes)	=	Transit vehicle trips	x	Travel time savings (minutes/trip)

Results

Using these equations and converting minutes to hours, the daily (weekday) travel time savings for transit riders and transit vehicles during the PM peak hour are shown in Figure 15. The daily person-hour savings are equivalent to about 1.25 full-time employees' hours for a year.

The transit vehicle hours saved could equate to a significant upgrade in service to one or more transit routes. For example (and depending on vehicle and operator availability), the potential savings is equivalent to 55 one-way trips that take one hour to complete. This could be five new PM peak trips on 11 routes, or enough capacity to carry more than 5,200 additional riders during the PM peak hour.

Figure 15 Estimated Weekday Hours of Transit Travel Time Saved with p.m. Peak Hour Area Pricing

Units	Daily hours saved
Person hours	2,592
Transit vehicle hours	55

Demographic and other characteristics of Metro riders, who represent the majority of riders in this analysis, are presented in Figure 16. Overall, these riders are fairly representative of King County residents. Notable differences include age, region of residence, and vehicle ownership. A greater percentage of Metro riders are likely in the 55+ age category than the county population; however, the Metro rider survey only includes respondents 16 years of age or older, so the age group proportions cannot be directly compared.

Metro riders tend to be more concentrated in Seattle and North King County (64% of Metro riders compared with 34% of King County residents), with fewer living in East and South King County compared to the county population as a whole. Metro riders are also more likely to live in households without a vehicle than King County residents overall. Metro riders are fairly representative of the King County population in terms of race and household income.

Figure 16 King County Metro Rider[13] and King County Resident[14] Demographic Characteristics

Characteristic	Attribute	KCM Riders	King County
Gender	Male	48%	50%
	Female	52%	50%
Age	0-16	NA	21%
	16-17	3%	
	18-34	25%	26%
	35-54	34%	29%
	55+	38%	25%
Region of Residence	Seattle / North King County	64%	34%
	South King County	19%	38%
	East King County	17%	28%
Race/Ethnicity	White	69%	67%
	Black or African-American	5%	6%
	American Indian or Alaskan Native	1%	1%
	Asian or Pacific Islander	17%	17%
	Multi-race	1%	6%
	Hispanic	5%	9%
	Other	0%	NA
Vehicle/Driver Information	Valid driver license	84%	NA
	Household owns a vehicle	76%	90%
	Vehicle for personal use	93%	NA
Annual Household Income	<$35,000	25%	22%
	$35,000 - $100,000	34%	39%
	>$100,000	32%	39%
Disability	Yes	14%	10%
	No	86%	90%

Because certain demographic groups are overrepresented among Metro's ridership, travel time transit time savings will likely be disproportionately allocated to these groups. Because the sources of data for Metro's ridership and King County's population are samples, it cannot be said with a high degree of confidence that difference of a few percentages between populations represents a real-world difference. For gaps that are more than a few percentage points, it can be

[13] King County Metro 2016 Rider Survey Report

[14] U.S. Census Bureau, 2016 American Community Survey Five-Year Estimates

said with more confidence that these groups will receive disproportionate benefits from transit travel time savings.

It is likely that, among King County residents, older people will disproportionately benefit from transit travel time savings, along with those living in Seattle and North King County. King County residents who do not own a car will also likely disproportionately benefit from transit travel time savings. Residents with a disability will likely disproportionately benefit.

Demographic groups living in King County that will disproportionately not receive benefit are likely to be Hispanic/Latino people, people identifying as multi-racial, and high-earning households.

Comparing Transit and Auto Travel Time

To assess existing transit service to Seattle's Center City area, a comparison of transit- and auto-based travel was conducted for each census block group in all four PSRC counties. This analysis was conducted using the Google Directions API, which was called to return a travel time between the centroid[15] of each block group and five destinations in the center city area. These five destinations were selected to balance geographic distribution of destinations with major activity centers:

- Occidental Square
- Columbia Tower
- Washington State Convention Center
- Space Needle
- Westlake Avenue N at Harrison Street

Both transit and auto mode API calls were given parameters instructing their trips to arrive as close to 8:45 a.m. as possible on a Wednesday. The five travel times (one for each destination) by auto and transit to each of the Center City destinations were then averaged to produce a mean transit travel time and mean auto travel time to Center City Seattle from each census block group. These mean transit and auto travel times were then used to produce total travel time difference in minutes and percent difference in travel time per census block group.

The significant shortcoming of this analysis is the lack of trips that are chained using non-walking and transit modes. Although the Google Directions API does incorporate walking into transit trips (after a certain number of minutes/miles of walking to get transit, Google Directions API stops considering a trip possible via transit, however), it does not allow for theoretical trip-takers to drive or walk—say, to a park-and-ride—to transit. This means that park-and-ride drivesheds, amongst other multimodal trips, are not included in the transit trips modeled for this analysis. For all block groups where transit trips were not possible, no travel time comparison was calculated.

Figure 17 shows the absolute difference in travel time (in minutes) for a.m. peak hour trips to the center city made via transit and auto. Figure 18 shows the same difference, symbolized as a percent.

[15] The US Census Bureau's standard INTPTLAT and INTPTLON fields were used in lieu of centroids; they are similar and are generally located outside of GIS water polygons.

Figure 17 Transit Time vs. Driving Time to Center City During AM. Peak Hour - Total Difference

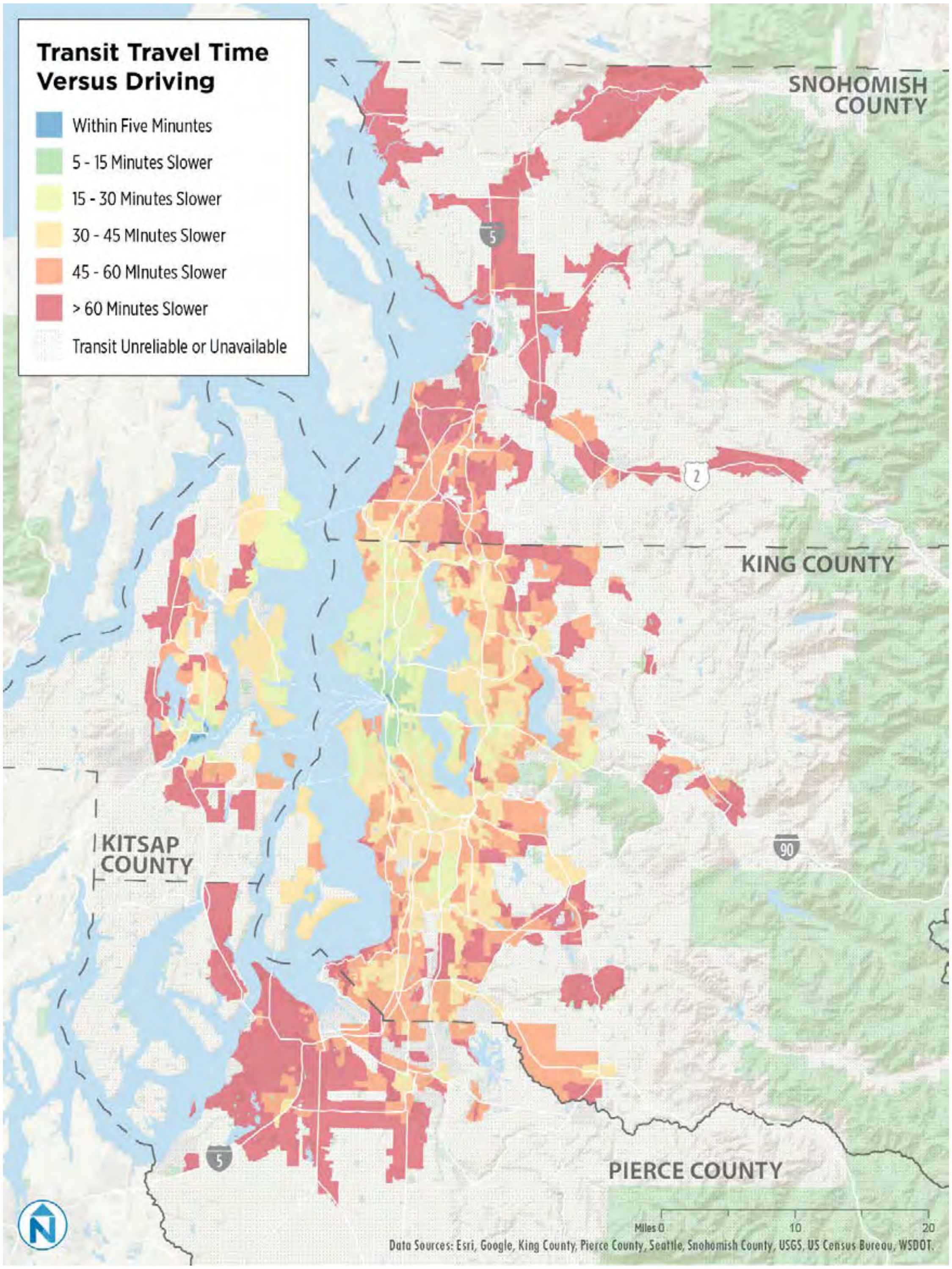
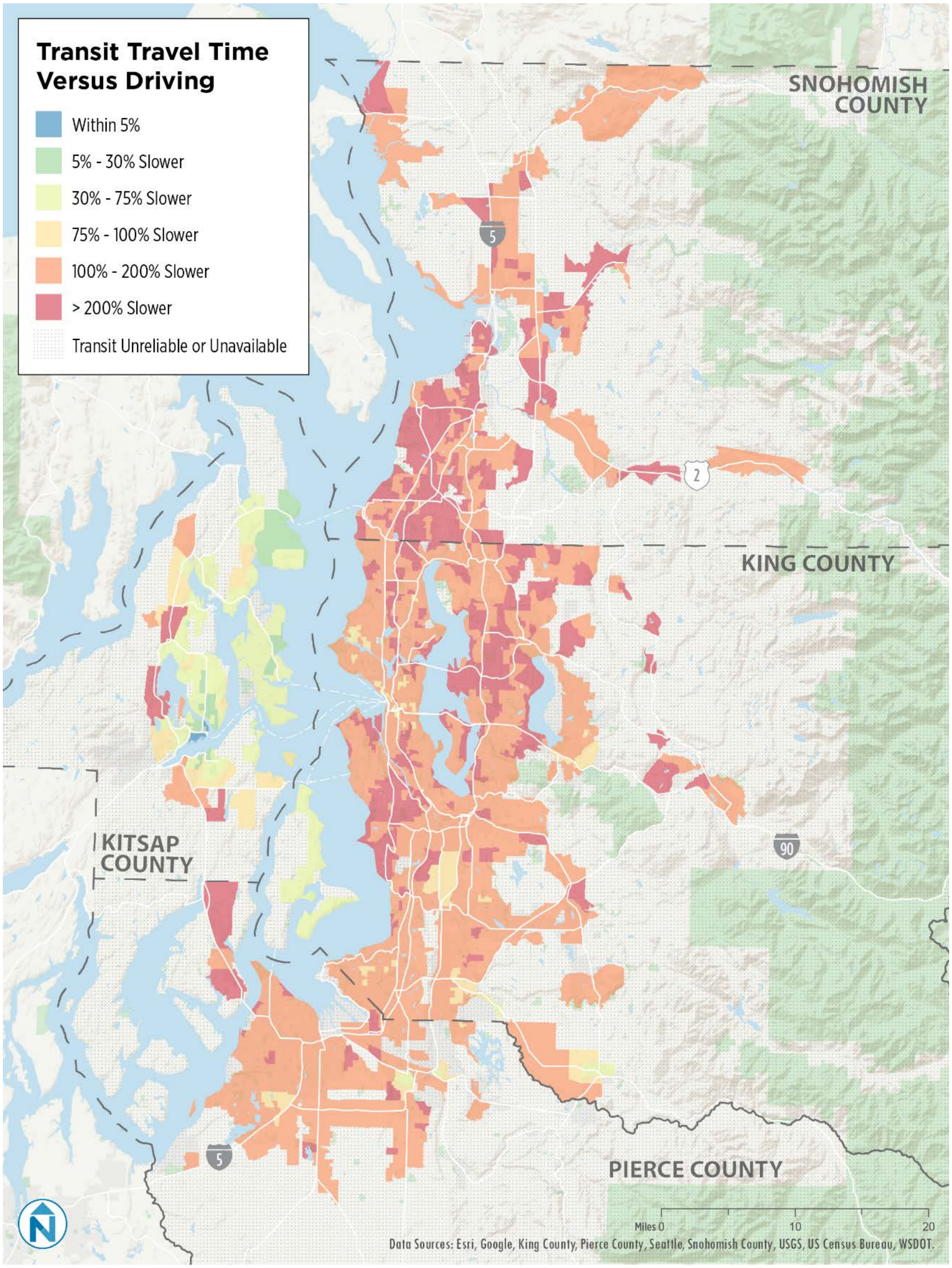


Figure 18 Transit Time vs. Driving Time to Center City During AM Peak Hour - Percent Difference



In both representations of travel time difference, the only areas that where transit is truly time-competitive with driving to the Center City are the Center City itself and Bremerton, which is

served by both the Kitsap Fast Ferry and the Washington State Ferry. Areas where transit travel is nearly time-competitive with auto travel are eastern portions of the Kitsap Peninsula, the City of Seattle, Issaquah Highlands, Kent, Puyallup, Sumner, and Lakewood. Elsewhere, driving to Center City Seattle in the a.m. peak is considerably faster than transit.

Fleet Pricing

The impacts and benefits of a congestion-reducing fleet pricing program would be highly dependent on the times, locations, and levels of pricing. The largely proprietary nature of data on fleet vehicle behavior makes it difficult to tailor these parameters to potential pricing program goals. This portion of the white paper explains data needs, discusses potential parameter definitions, and outlines a theoretical understanding of likely impacts and benefits.

To produce a thorough impacts and benefits analysis of a fleet pricing program—which would follow sequentially—the following variables must be addressed:

- Data availability for fleet vehicles in Seattle
- Definition of fleet vehicles for congestion pricing purposes
- Identification of applicable pricing tactics
- Assessing pricing-relevant technologies of fleet vehicles
- Planning data collection for iterative implementation

Baseline Fleet Data

The foundation for successful fleet pricing is data that provide an accurate understanding of baseline fleet conditions. At a minimum, it is imperative to have a rough understanding of how many vehicles of each type are operating within a potential pricing zone. At present, SDOT has access to at least two datasets that can be used to assess baseline fleet conditions: Teralytics mobile phone data and aggregated TNC origin-destination data. These data are not yet available to the project team, limiting the fleet pricing analysis.

[Section will be updated with baseline data when available. Project team members are working with SDOT staff on a data agreement]

Defining Fleet Vehicles

Perhaps the most essential parameter a fleet pricing program must define is what constitutes a “fleet vehicle.” Potential categories/definitions of fleet vehicle are:

- Ride-hailing vehicles (e-hailing and/or street-hailing type)
- First-mile/last-mile delivery vehicles (trucks, vans, and/or personal vehicles)
- Tour vans and buses
- Heavy trucks (and/or other high-emissions vehicles)
- Vehicles operated by entities with more than *x number* of registered vehicles
- Vehicles owned by a incorporated entity, as opposed to an individual

Beyond these definitions, vehicles can be targeted according to their relative emissions, size, or congestion production. Without a rough understanding of current vehicle type shares and volumes in Seattle, it is difficult to align congestion pricing goals with proposed fleet pricing parameter definitions.

However, there has been robust enough evaluation of existing congestion pricing programs to support a discussion of the generalized theoretical understanding of fleet pricing impacts:

- **Ride-hailing vehicles** (and particularly e-hailing vehicles) have been widely implicated as a major contributor to increased congestion in a number of U.S. cities.[16,17,18,19,20] Pricing e-hailing vehicles, which typically operate as a *de facto* fleet, could reduce their overall vehicle miles traveled (VMT).

  An analysis conducted on taxi use in New York City found that for-hire passengers are less sensitive to price increases than other road users, suggesting that only a significant charge would be effective in reducing ride-hail VMT. One examination of pricing ride-hailing vehicles in New York City concluded that a per-hour charge would be most effective,[21] while the New York City Council recently capped the number of e-hailing vehicles allowed to operate in the city.[22]

  Pricing e-hailing vehicles may be a sound tactic, as Uber has publicly supported a congestion pricing program in Seattle.[23] Uber CEO Dara Khosrowshahi recently wrote: "One policy we plan to put our energy behind is congestion pricing, which is viewed by urban planners, transit advocates, and academics as the single best way to ease the road congestion that is choking many cities across the globe. We're ready to do our part to help cities that want to put in place smart policies to tackle congestion—even if that means paying money out of our own pocket to pass a tax on our core business."[24]

- **First-mile/last-mile delivery vehicles,** such as those used by Amazon, FedEx and UPS, wholesale distributors, and other goods deliverers, likely cause congestion disproportionate to their VMT because of typical delivery behaviors (including reversing to loading docks, double-parking, cruising for load zones, and slow travel). In New York City, it was recommended that these vehicles be priced at 2.2 times the rate of personal vehicles due to their outsized impact on congestion.[25]

[16] San Francisco County Transportation Authority. October 2018. "TNCs & Congestion". <https://www.sfcta.org/sites/default/files/content/Planning/TNCs/TNCs_Congestion_Report_181015_Final.pdf>

[17] Schaller Consulting. July 25, 2018. "The New Automobility: Lyft, Uber and the Future of American Cities". <http://www.schallerconsult.com/rideservices/automobility.pdf>

[18] Metropolitan Area Planning Council. February 2018. "Fare Choices: A Survey of Ride-Hailing Passengers in Metro Boston". <http://www.mapc.org/wp-content/uploads/2018/02/Fare-Choices-MAPC.pdf>

[19] Gutman, David. November 5, 2018. *Seattle Times*. "How popular are Uber and Lyft in Seattle? Ridership numbers kept secret until recently give us a clue". <https://www.seattletimes.com/seattle-news/transportation/how-popular-are-uber-and-lyft-in-seattle-ridership-numbers-kept-secret-until-recently-give-us-a-clue/>

[20] UC Davis Institute of Transportation Studies. October 2018. "Disruptive Transportation: The Adoption, Utilization, and Impacts of Ride-Hailing in the United States". <https://itspubs.ucdavis.edu/wp-content/themes/ucdavis/pubs/download_pdf.php?id=2752>

[21] Schaller Consulting. July 25, 2018. "The New Automobility: Lyft, Uber and the Future of American Cities". <http://www.schallerconsult.com/rideservices/automobility.pdf> p. 9.

[22] Local Law No. 147 (2018) of City of New York. Int 0144-2018. <https://legistar.council.nyc.gov/View.ashx?M=F&ID=6467078&GUID=F5AFBAEE-1A39-4540-B4F1-D386701C52B9>

[23] Beekman, Daniel. October 8, 2018. *Seattle Times*. "Uber gets political, will spend $10M pushing for 'congestion pricing' tolls in Seattle, elsewhere". <https://www.seattletimes.com/seattle-news/politics/ride-hail-companies-to-lobby-for-congestion-pricing-in-seattle-as-city-considers-tolling-downtown-streets/>

[24] Khosrowshahi, Data. September 26, 2018. "The Campaign for Sustainable Mobility". <https://www.uber.com/newsroom/campaign-sustainable-mobility/>. Emphasis by Nelson\Nygaard.

[25] Fix NYC Advisory Panel. January 2018. "Fix NYC Advisory Panel Report". <http://www.hntb.com/HNTB/media/HNTBMediaLibrary/Home/Fix-NYC-Panel-Report.pdf>. p. 21.

Delivery vehicles, which can be personal autos, vans, or light or heavy trucks, are an important component of a high-functioning urban economy and would need to be priced in a way that avoids disproportionate charges to certain industries. An analysis of Stockholm business revenues before and after congestion pricing implementation found that the pricing program had no negative impacts; on the contrary, center city retail and wholesale sectors showed positive changes in revenue versus the county at large.[26] Because delivery vehicles infrequently make discretionary trips, their elasticity rates are likely lower than personal autos, meaning that some portion of priced trips will likely pass a congestion charge on to consumers.

- **Tour vehicles,** such as terrestrial and amphibious tour buses, operate throughout Seattle, with higher trip volumes during summer and the peak tourist season. These vehicles are largely diesel-powered, which makes them significant contributors to air and noise pollution. A fleet charge on tour vehicles would likely be passed on to consumers, which could reduce ticket sales and revenues for the tour companies.
- Pricing **heavy trucks** (or other high-emissions vehicles) would charge vehicles producing the greatest relative rates of harmful emissions and damage to roadways. These vehicles typically also cause more congestion than personal autos when driven in urban environments because of their slow movement, delivery behaviors (e.g., backing up to loading docks, double-parking), and poor maneuverability.

  Semi-trailers are not typically operated in the center city of Seattle because of its land use and street network, so pricing these vehicles may only affect a small proportion of total VMT. Rather, it may be prudent to consider a ban on trucks over a certain size in the center city (except with a special permit) as a component of a fleet pricing initiative. As with pricing first-mile/last-mile delivery vehicles, any fleet charge would likely be passed on to consumers. Most semi-trailer container trips to and from the Port of Seattle would likely not be priced, as they do not typically pass through Seattle's center city.
- "Fleet vehicles" could also be defined by counting the number of vehicles operated by an individual entity, regardless of type or purpose. This could take the form of a fleet charge for a vehicle that **is owned by an entity that operates *x number* of other vehicles**, or for any vehicle **owned by an incorporated entity and not a person.** In London, a vehicle receives a £1 discount on the congestion zone charge if it is part of a fleet, which is defined as six or more vehicles.[27] Rigorous enforcement for both of these classification approaches would be both necessary and challenging.

Fleet pricing should be informed by the general understanding that—to the extent fleet vehicles provide goods and services—any charge will likely be passed on to consumers. Additionally, goods movement trips are rarely discretionary; evidence from Sweden's congestion pricing program showed that only 5% of "professional traffic" was eliminated by implementing a congestion charge, suggesting a low level of price sensitivity.[28]

[26] City of Stockholm Traffic Administration. September 21, 2009. "Analysis of traffic in Stockholm". <http://www.stockholm.se/PageFiles/70349/Sammanfattning%20eng%20090918_.pdf>

[27] The threshold was lowered from ten to six vehicles: <http://www.politics.co.uk/reference/congestion-charge>

[28] Eliasson, Jonas. July 2014. "The Stockholm congestion charges: an overview". <http://www.transportportal.se/swopec/cts2014-7.pdf>. p. 14.

Define Pricing Parameters

A successful fleet pricing program depends on well-defined pricing parameters. To best achieve potential congestion pricing goals, SDOT will need more robust datasets with which to set fleet pricing zones, times, charge amounts, and vehicle classifications. Ideal data would give analysts a clearer picture of when, where, and what types of vehicles are used in Seattle.

Considerations when defining fleet pricing parameters rest largely on estimated elasticity rates of various fleet vehicle and trip types. Although these rates are unique to a metro area, there are some precedent estimations available. Swedish researchers have used 10 years of congestion pricing experience to estimate elasticities for private vehicles, trucks, and all vehicles, in both peak and off-peak travel periods.[29] Elasticity estimates could be produced from other congestion pricing data abroad and from U.S. tolling data. These sources likely would need to be combined to inform parameter definition for fleet pricing in Seattle.

Definitions of fleet pricing parameters should be closely tied to theoretical understandings of likely outcomes. For example, consider the following potential outcomes:

- Pricing peak hour and daytime first-mile/last-mile delivery trips could incentivize delivery services to operate at night.
- Imposing hefty charges on larger delivery vehicles may shift fleet owners to smaller vehicle types or to non-auto delivery modes, such as UPS' current e-trike small pod delivery pilot in downtown Seattle.[30]
- Pricing all incorporated entity vehicles may reduce traffic caused by people with access to "company cars," shifting their trips to public transport.
- Pricing e-hailing fleet vehicles could make public transit and active transportation more attractive travel options.

In general, fleet pricing should reduce discretionary professional VMT.

Fleet Pricing Technologies

Pricing fleet vehicles could be simpler logistically than pricing personal use vehicles, as market penetration of vehicle tracking and communication technology is more consistent in fleet vehicles. E-hailing vehicles, for example, are tracked across both space and time by their parent companies, making potential price assessment and billing processes simple. Other data collected by e-hailing companies include deadhead time, passenger count, and vehicle type—all of which could be incorporated into a fleet pricing program.

Recently-implemented federal electronic logging device rules have accelerated the trucking industry's transition toward advanced onboard technology. Operators of large fleets are adopting GPS tracking of vehicles, and truck manufacturers have begun incorporating GPS into new vehicles, representing an opportunity to introduce and streamline fleet pricing for these vehicle types.

[29] Centre for Transport Studies Stockholm. February 2017. "The Swedish Congestion Charges: Ten Years On". <http://www.transportportal.se/swopec/cts2017-2.pdf>

[30] UPS. October 25, 2018. "UPS To Launch First-Of-Its-Kind U.S. Urban Delivery Solution In Seattle." <https://www.pressroom.ups.com/pressroom/ContentDetailsViewer.page?ConceptType=PressReleases&id=1540482965617-103>

Fleet Pricing as a Data Collection Opportunity

Fleet pricing is an opportunity to fill aforementioned data gaps and to use these new data to operate an iterative fleet pricing program. A timetable could be set, for example, to analyze historic charging data, re-evaluate a fleet pricing program's progress towards stated goals, and adjust pricing parameters accordingly. These changes could be made on a fully-dynamic, minute-by-minute schedule, or at a fixed interval (e.g., every month or every quarter).

Because a successful fleet pricing program depends on accurate data, it is important to plan, from the outset, what data must be collected and how it will be iteratively incorporated into program optimization.

BEHAVIOR CHANGE AND PRICE SENSITIVITY

Behavior Change

Changes in travel behavior have been documented following the implementation of congestion pricing in cities such as London, Stockholm, and Singapore. These changes include decreased volumes of private vehicles in charged areas, increased public transit activity, and redistributions of traffic flows.[31,32] Additional behavior changes that are often made but are more difficult to document include the following:[33]

- Some trips may not be made at all
- Some trips may be made using an alternate travel mode
- Some trips may be deviated to alternate routes or destinations
- Some trips may be shifted to different times of day

Research into how congestion pricing can prompt behavior change shows trends in the relationship between price and travel behavior change:[34]

- Higher value trips (i.e., commute trips and business travel) tend to be less price sensitive than lower value trips (i.e., shopping and recreation trips)
- People with higher incomes tend to be less sensitive to pricing than people with lower incomes
- If better travel options are available, trips tend to be more price sensitive
- The impacts of fees can be affected by how they are promoted, structured, and collected
- People who drive are more likely to accept vehicle price increases if they are presented as part of a larger program that is considered fair and provides dispersed benefits

[31] International Council on Clean Transportation. April 2010. "Congestion Charging: Challenges and Opportunities". https://www.theicct.org/sites/default/files/publications/congestion_apr10.pdf

[32] World Resources Institute. January 2017. "Study on International Practices for Low Emission Zone and Congestion Charging," https://www.wri.org/sites/default/files/Study_on_International_Practices_for_Low_Emission_Zone_and_Congestion_Charging.pdf

[33] Transport for London. September 2008. "Demand Elasticities for Car Trips to Central London as revealed by the Central London Congestion Charge". http://content.tfl.gov.uk/demand-elasticities-for-car-trips-to-central-london.pdf

[34] Victoria Transport Policy Institute. February 27, 2017. "Understanding Transport Demands and Elasticities: How Prices and Other Factors Affect Travel Behavior". http://www.vtpi.org/elasticities.pdf. pp. 41-43.

- The perception of fairness is a key factor in how people respond to pricing and their preferences for different price structures
- The perception of too much complexity in a cost structure can motivate people to “disengage” from a priced mode
- Travel behavior can be influenced by the method and timing of road pricing payments

Price Elasticity

A traveler’s sensitivity to changes in price is called price elasticity. It is the foundation of models to estimate travel behavior changes in a congestion pricing scenario. This number can be estimated from observed elasticities on similar priced roads (such as the SR 520 bridge) or from experiments in other cities. A well-estimated elasticity makes it possible to forecast how travel behavior may change based on a proposed congestion pricing program.

Estimating Elasticities

A travel-price elasticity is generally a single number that represents the percentage change in consumption of travel (which can be defined as trip-taking, miles driven, mode used, etc.) that results from a 1% change in price. Elasticities of some sort have been estimated for most major road tolling studies, transit fare analyses, and other urban planning pricing studies. Because there are so many variables that interact with a traveler’s trip-making decisions, elasticities are best estimated based on observed responses to price changes.

Figure 17 shows a sample of vehicle travel elasticities based on peak/off-peak road pricing and traveler income. Figure 18 provides equations for calculating price elasticity of a priced travel mode or path.[35]

Figure 19 Consumer Demand Elasticities (2000)

	Price, Peak	Price, Off-Peak	Income
Vehicle travel - essential trips	-0.16	-0.43	0.70
Vehicle travel - optional trips	-0.43	-0.36	1.53
Bus, Tram, Metro passenger-kms	-0.19	-0.29	0.59
Rail passenger-kms	-0.37	-0.43	0.84

Note: Table reflects data collected in studies of travel in European cities.

Source: VTPI, 2017

[35] Victoria Transport Policy Institute. February 27, 2017. “Understanding Transport Demands and Elasticities: How Prices and Other Factors Affect Travel Behavior”. http://www.vtpi.org/elasticities.pdf

Figure 20 Equations for Road Pricing Elasticity

Elasticity Equations

Arc Elasticity

$$\eta = \frac{\Delta \log Q}{\Delta \log P} \quad \text{or} \quad \eta = \frac{\log Q_2 - \log Q_1}{\log P_2 - \log P_1}$$

$$P_2 = P_1 \left(\frac{Q_2}{Q_1}\right)^{\frac{1}{\eta}} \quad \text{or} \quad Q_2 = Q_1 \left(\frac{P_2}{P_1}\right)^{\eta}$$

Mid-Point Arc Elasticity

$$\eta = \left[\frac{\Delta Q}{\frac{1}{2}(Q_1+Q_2)}\right] \div \left[\frac{\Delta P}{\frac{1}{2}(P_1+P_2)}\right] \quad \text{or} \quad \eta = \left[\frac{\Delta Q}{P_1+P_2}\right] \div \left[\frac{\Delta P}{Q_1+Q_2}\right] \quad \text{or} \quad \eta = \frac{(Q_2-Q_1)(P_1+P_2)}{(P_2-P_1)(Q_1+Q_2)}$$

$$P_2 = P_1 \times \left[\frac{Q_1(\eta-1)+Q_2(\eta+1)}{Q_2(\eta-1)+Q_1(\eta+1)}\right] \quad \text{or} \quad Q_2 = Q_1 \times \left[\frac{P_1(\eta-1)-P_2(\eta+1)}{P_2(\eta-1)-P_1(\eta+1)}\right]$$

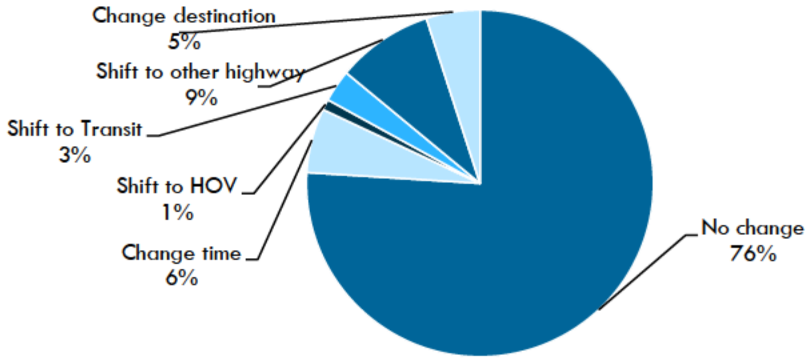
where η is the elasticity value, Q_1 and Q_2 are before and after consumption, and P_1 and P_2 are before and after price or service.

Source: VTPI, 2017

Because congestion pricing has not been implemented in any U.S. cities, elasticity estimates used to model mode shift, reductions in travel, or trip re-routing in a Seattle congestion pricing scenario will need to be carefully selected. A sampling of relevant elasticities includes:

- **Puget Sound Traffic Choices Study:** PSRC conducted a study of 275 households to develop elasticities for potential tolling systems in the Puget Sound region. This analysis is highly relevant to a Seattle congestion pricing effort. Its shortcomings include the dates in which it was conducted (early 2000s) and its geography (the Seattle metro area).
- **London Congestion Charge:** Elasticities based on observed traveler responses to the introduction and subsequent changes to London's central zone congestion charge are a helpful reference for Seattle. London's urbanized world market-based economy, similar demographic-employment dynamics, and travel landscape are a better reference point for congestion pricing in Seattle than—for example—Singapore, where the sociopolitical context differs more significantly.
- **New York Bridges & Tunnel Tolls:** Elasticities developed from observed travel changes in New York City are relevant because Seattle's geography is similar to New York's; auto access to both cities is limited by water.
- **SR 520 Bridge Tolls:** Analysis of the relationship between SR 520 bridge tolls and travel behavior would be valuable in informing congestion pricing elasticities in Seattle. Although much of this work has been conducted with PSRC's travel model to help set the current variables toll rates, defined elasticity rates have not been shared publicly. Since the introduction of SR 520 bridge variable tolling and accompanying improved transit service, it has been estimated that 76% of bridge users made no change in their travel and 11% of users made the same trip but at a different time or using a different mode (Figure 19).

Figure 21 SR 520 Tolling Effects on Demand[36]



More difficult to measure are elasticities that estimate the relationship between road price increases and travelers shifting away from auto travel modes. Because there are so many variables that interact with a traveler's trip-making decisions, a simple price-traffic volumes elasticity is likely a more reliable predictor of congestion pricing impacts than a price-mode share elasticity, which would attempt to tease out the relationship between pricing, geography, travel options, time-of-day travel distribution, and demographics.

That being said, surveys and other tools (such as PSRC's travel models) can be used in conjunction with traffic volume elasticities to estimate the amount of trips that might shift to transit in a congestion pricing scenario. It is likely this shift would occur if road pricing were introduced to the Puget Sound region, given the availability of high-capacity transit, geographical constraints for accessing Seattle's center city, and high downtown core parking prices. An analysis of this type was performed as a part of the Puget Sound Traffic Choices Study, finding that the elasticity of home-to-work travel was approximately four times greater for residents with access to high-quality transit.[37]

Applying Elasticities

After identifying and vetting relevant elasticities for a Seattle congestion pricing approach, a high-level travel model will need to be developed to implement them, producing estimated reductions in traffic, VMT, time-of-day travel, or mode shifts (depending on the type of elasticity application).

Estimates of travel reductions cannot be performed, however, without details on the types of facilities, vehicles, trips, times, and/or people to be priced. These inputs, along with information identified elsewhere in this report (e.g., sources of trips traveling to the priced area, the distance and time of those trips, and the demographics of the trip-takers) will also be integral to this high-level model.

Through a separate effort, SDOT has research underway to develop an understanding of the price elasticities associated with on-street parking. When that research is complete in late December 2018, the project team will review the findings for inclusion in this white paper.

[36] WSDOT, 2012. Managing Congestion with Tolls on the SR 520 Floating Bridge. <https://www.ibtta.org/sites/default/files/Stone_Craig.pdf>. p. 12

[37] p. 88

Demand for Additional Transit Service

[Research on the following questions is underway:

- What does the research say about the impacts of improved frequency and reliability on ridership?
- How can we use this to estimate the number of new transit riders, and thus the amount of service needed to accommodate increases in ridership?]

Household Income Impacts

[When the research above is complete, additional analysis will be undertaken to answer the following questions:

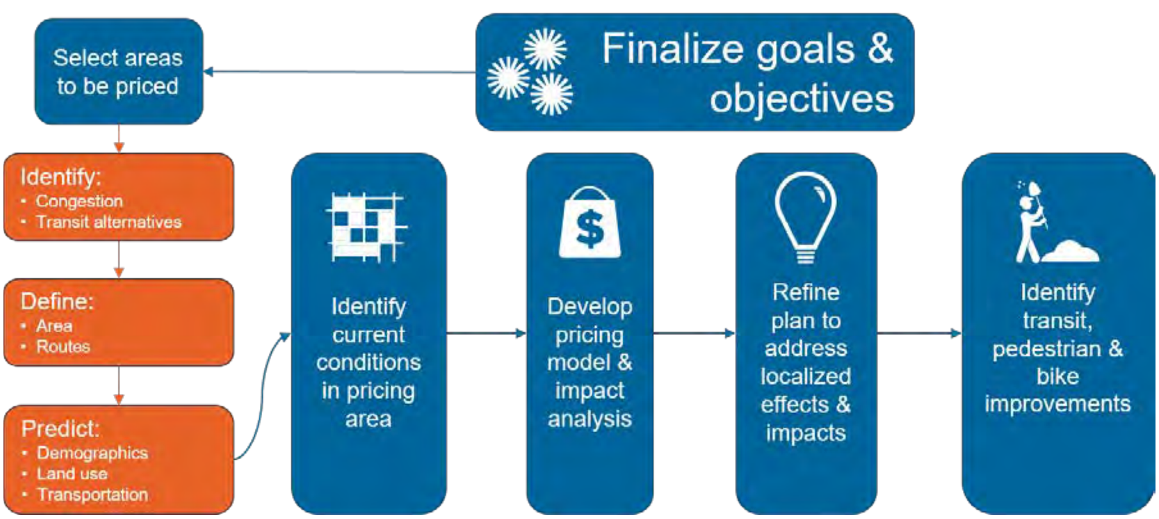
- Using the results of research in prior two sections, who is still driving?
- What is the demographic profile of those still driving?
- What is the relative scale of household income impacts for those still driving?]

PHASE 2: DETAILED CONGESTION PRICING EVALUATION

This impacts and benefits analysis provides a high-level summary of how various congestion pricing strategies might distribute impacts and benefits to different groups of people who use Seattle's roadways.

To understand the full impacts of congestion pricing strategies on various communities—and to develop a potential congestion pricing program in a way that meets City of Seattle goals—a more thorough analysis and evaluation is needed, supported by extensive community engagement. Figure 19 describes a potential process for moving forward with additional analysis in Phase 2 of the SDOT Congestion Pricing Study.

Figure 22 Proposed Analysis Approach for Phase 2 of Congestion Pricing Study



The first step in this proposed approach is to confirm and finalize the goals and objectives of congestion pricing in Seattle. This would be informed by deep and wide community and

stakeholder involvement that would begin in 2019 and continue throughout the analysis and program development processes.

The next steps involve clearly defining pricing programs to be evaluated, documenting existing conditions, and assessing candidate technologies for administering the pricing program(s). The existing conditions would then be modeled to support comparison with a modeled pricing program. This would likely be an iterative process of refining and re-analyzing the impacts of various congestion pricing scenarios. Ultimately, the analysis would support the recommendation for a preferred program, supported by investments in related transportation infrastructure and service improvements.

From: Garman, Kate
To: Brinson, Leslie; Roskin, Miriam; Zimbabwe, Sam; Helmbrecht, Elliot; Garfinkel, Martin; Levitas, Kerem; Prentice, Mark; Blair, Kyla; Auriemma, Anthony
Cc: Thompson, Adrienne; Rolf, Kylie; Adkins, Genesee
Subject: RE: AHR Final Mayoral Briefing -- LAST UPDATE
Date: Wednesday, April 24, 2019 1:30:23 PM
Attachments: AHR Final Mayoral Briefing.pptx

All,
Final slides attached. The final agenda is below. When the group before you exits, please do not automatically come in (this is a change). The e-team will likely discuss some things in between presentations—briefly. I will come get you to let you in the room.
3:00-3:10: Tax Structure [Kate]
3:10-3:20: TOD Housing Spend Plan [Leslie + Miriam]
3:20-3:30: Transit and Mobility Spend Plan [Sam & Elliot]
3:30-3:50: Work Protections and Spend Plan [Marty & Kerem]
3:50-4:25: Comms/Outreach/Council [Mark/Kyla/Anthony]
4:25-4:30: Next Steps [Kylie]
Thank you all so much for your work leading up to this! See you soon.
Kate

From: Garman, Kate
Sent: Wednesday, April 24, 2019 11:07 AM
To: Brinson, Leslie <Leslie.Brinson@Seattle.gov>; Roskin, Miriam <Miriam.Roskin@seattle.gov>; Zimbabwe, Sam <Sam.Zimbabwe@seattle.gov>; Helmbrecht, Elliot <Elliot.Helmbrecht2@seattle.gov>; Adkins, Genesee <Genesee.Adkins@seattle.gov>; Garfinkel, Martin <Martin.Garfinkel@seattle.gov>; Levitas, Kerem <Kerem.Levitas@seattle.gov>; Prentice, Mark <Mark.Prentice@seattle.gov>; Blair, Kyla <Kyla.Blair@seattle.gov>; Auriemma, Anthony <Anthony.Auriemma@seattle.gov>
Cc: Thompson, Adrienne <Adrienne.Thompson@seattle.gov>; Rolf, Kylie <Kylie.Rolf@seattle.gov>
Subject: AHR Final Mayoral Briefing -- LAST CALL FOR EDITS
All-
Thank you thank you thank you for getting everything to me. This is the complete presentation for today. SPEAK NOW OR FOREVER HOLD YOU PEACE BY 1:30 WHEN THIS THING GOES TO PRINT.
I'll have multiple copies printed out, just bring yourself during your time. Thanks!!
Kate

Affordable Housing Revenue

April 24, 2019

Agenda

▪ Tax Structure [Kate]	10 minutes
▪ TOD Housing Spend Plan [Leslie + Miriam]	10 minutes
▪ Transit and Mobility Spend Plan [Sam & Elliot]	10 minutes
▪ Work Protections & Outreach [Marty & Kerem]	20 Minutes
▪ Comms/Outreach/Council [Mark + Kyla +Anthony]	35 Minutes
▪ Next Steps [Kylie]	Conclusion

Proposal: Goals

[redacted]

Proposal: Specifics

[redacted]

Revenue Projections

[redacted]

Spending Allocation

- First Four Years

[redacted]

- Remaining Years

[redacted]

Revenue Allocation

[redacted]

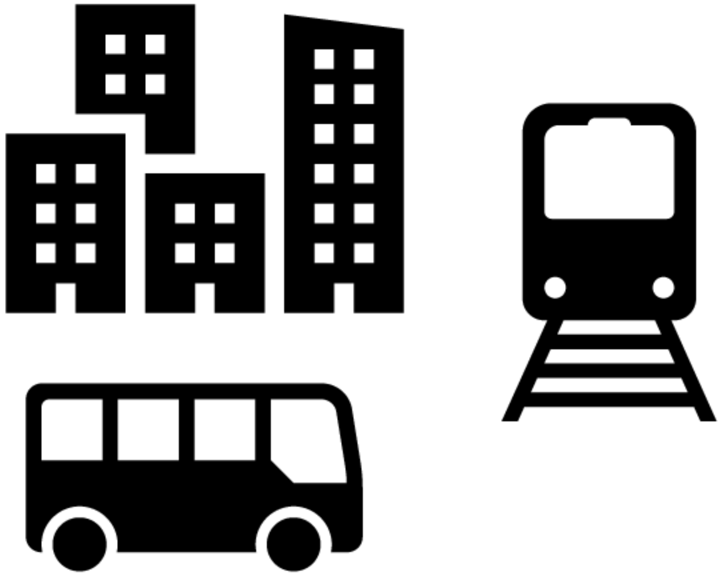
[redacted]

Affordable Housing

INVESTMENTS IN TRANSIT ORIENTED DEVELOPMENT

Transit-Oriented Affordable Housing

[redacted]



[redacted]

Decision Points on Housing Spend Plan

[redacted]

[redacted]

Transit & Mobility: Overview

STRENGHTENING OUR MULTIMODAL NETWORK

MITIGATING THE IMPACTS OF TNCS

Strengthening Our Multimodal Network

[redacted]

[redacted]

[redacted]

Mitigating the Impacts of TNCs

[redacted]

[redacted]

Worker Protections: Key Decisions

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Week of April 29

- Outreach: Identify key stakeholders to form steering committee and begin initial outreach of scheduling meetings.
- Council: Meet with prospective Council champions – O'Brien, Mosqueda, Harrell – to inform them of general thinking about legislation and plans. Solicit initial feedback.
- Communications: Message and materials development under the following frames: transportation, congestion, housing, climate and livability.

Week of May 6

- Outreach: Key stakeholder outreach with JAD and staff to “steering committee” members.
- Council: Continue discussions with Council champions to secure support, brief Central Staff analysts, collaboratively determine committee schedule.
- Communications: Message and materials development.

Week of May 13

- Outreach: Stakeholder engagement expands with 1-2 meetings that include JAD/Shefali, key stakeholders, and Council champions and additional stakeholders
- Council: Include Council champions in stakeholder engagement meetings. Schedule briefings for remaining Councilmembers.
- Communications: Develop full suite of materials in anticipation of May 27th rollout.

Week of May 20

- Outreach: Continue stakeholder outreach through JAD, Shefali and steering committee – continue to identify and produce validators.
- Council: Begin briefing remaining Councilmembers. Connect validators with Council champions and other CMs.
- Communications: Finalize full suite of materials.

May 27th (Launch Week!!)

- Outreach: Prep validators with messaging toolkits, launch event and to be public speakers in support of this legislation.

- Council: Finish briefing all Councilmembers prior to public announcement. Include Council champions in launch event.

- Communications: Public rollout, including: Media pre-briefs, toolkits for allies and validators, launch event, one-on-one interviews.

June - August Council Process

******During this period – Continued proactive communications, outreach and activation of validators***

- June 10 – Bill Transmitted to Council
- June-July – Committee Discussions begin (2-3 mtgs per committee)
    - O'Brien Transportation Committee: TNC Tax ORD
    - Mosqueda Workers' Rights Committee: Driver Rights ORD
- Early August – Potential Committee Votes
    - August 1: Driver Rights ORD
    - August 6: TNC Tax ORD
- August 12 – Full Council Vote

September Council Process + Other Factors

- September
  - If committee consideration stretches past August recess, both committees meet twice in September as back-up dates
  - September 23: Last Full Council vote prior to Budget Season

- Other Factors

From: Adkins, Genesee
Sent: Tuesday, March 19, 2019 6:00 PM
To: Krawczyk, Tracy; Simpson, Kristen; Castleman, Kris; Hobson, Mafara; Zimbabwe, Sam; Melanson, Karen; Lorenzana, Candida; VanValkenburgh, Cristina; Schellenberg, Dawn; Rula, Kelly
Subject: RE: Congestion Pricing
Attachments: TOD.Transport.Worker Protections. 3.12.2019.pptx

All: Here's the presentation that was used in e-team last week, just fyi. We have more info to share from e-team as well as some subsequent meetings. I'll guide our time, mostly focused on next steps re spend plans.

See you tomorrow. Thanks!
Genesee

-----Original Appointment-----
From: Propst, Roberta **On Behalf Of** Adkins, Genesee
Sent: Friday, March 15, 2019 4:44 PM
To: Adkins, Genesee; Krawczyk, Tracy; Simpson, Kristen; Castleman, Kris; Hobson, Mafara; Zimbabwe, Sam; Melanson, Karen; Lorenzana, Candida; VanValkenburgh, Cristina; Schellenberg, Dawn; Rula, Kelly
Subject: Congestion Pricing
When: Wednesday, March 20, 2019 12:30 PM-12:55 PM (UTC-08:00) Pacific Time (US & Canada).
Where: DOT_SMT_3854

Meeting requested by Genesee.

TOD/Transportation/Worker Protections Revenue Planning

E-Team Briefing

March 14, 2019

Agenda

- Goals for Policy
- Tax and fees in other cities
- Recap of anticipated revenue and allocation to various spending areas
- Transportation Spend Plan
- Work Protections & Companion OrdinanceUpdate
- Timeline to move forward

Proposal: Goals

[redacted]

Proposal: Specifics

[redacted]

[redacted]

Taxes and Fees in other cities

City	Fee or Tax	Year Most Recent Action Passed	Estimated Revenue	What the revenue is going toward
Massachusetts	$0.20 tax	2016	$13M in 2017	50/50 Earmarked for transportation projects and to help the taxi industry adapt to new technologies and provide job training
New York City	Tax per ride in Manhattan geofence: $2.50 on yellow taxis $2.75 on other for-hire, including TNCs $0.75 for car pool/shared rides	April 2018 – passed at state level	Could generate up to $605M per year	Going toward the subway system
Philadelphia	1.4% tax	2016	$3.6M	$2.6M for public schools, $1M to enforcement and regulation of TNCs
San Francisco	3.25 tax to single-use rides; 1.5% tax rate to shared carpool; AV TNC's would be included in the tax	July 31, 2018	$30M per year	Transportation infrastructure and operations throughout the City
Washington DC	6% tax on revenue	July 2018	$23M per year	Revenue will go toward funding the District Metro. Note: the 6% rate now puts taxis and TNC's at the same tax and fee level

Revenue Projections

[redacted]

Housing Spend Plan

[redacted]

Transportation: Part 1 – Pieces in Motion

[redacted]

Transportation: Part 2 – Needs & Spend Plan

- SDOT has pre-existing budget pressures as well as emerging asset and program needs.

- Spend levels could address both without creating unreasonable expectations.

[redacted]

Worker Protections Part 1

[redacted]

Worker Protections Part 2

Create minimum Labor Standards for drivers

- Minimum Compensation + Expenses

[redacted]

- Transparency

[redacted]

- [redacted]

E-Team Briefing Schedule

- 3/14 Transportation Spend Plan + Worker Protections
- 3/21 FAS Implementation + TOD Spend Plan
- 3/28 Communications, Outreach and Council Strategy
- *[Week of April 1: Mayoral Briefing]*
- 4/4 Confirm spend plans
- 4/11 Driver Protection Companion Ordinance
- 4/18 Department Director Meeting + Strategy of Implementation
- 4/25 SDOT Literature Review Complete

Staff Meeting in Parallel with E-Team

- SDOT
  - Genesee Adkins
  - Elliot Helmbrecht (MO)
  - Kelly Rula
  - CBO Partner: Saroja Reddy
- FAS
  - Doug Carey
  - Glen Lee
  - Mary Mitchell
  - CBO Partner: Jennifer Devore
- OH
  - Miriam Roskin
  - Leslie Brinson (MO)
  - CBO Partner: Julie Dingley
- OLS
  - Jenee Jahn
- CAO
  - Sara O'Connor-Kriss
- MO/CBO
  - Kate Garman
  - Kylie Rolf
  - Adrienne Thompson
  - George Emerson
  - Dave Hennes

Outreach Plan (Kyla/DON)

Communications Plan (Mark/Kamaria)

Council Engagement Plan (Anthony)

From:	Adkins, Genesee
To:	Rula, Kelly; Castleman, Kris; Lo, Kevin; Krawczyk, Tracy; Simpson, Kristen; Hobson, Mafara; Melanson, Karen; Lorenzana, Candida; VanValkenburgh, Cristina; Schellenberg, Dawn; Williams, Lorelei
Cc:	Zimbabwe, Sam
Subject:	RE: Congestion Pricing
Date:	Tuesday, April 16, 2019 11:13:33 AM
Attachments:	AHR Mayoral Memo Template Draft 4-16-19_SDOT.docx

All: Here is my shot at our 1-page summary for the briefing book (see page 4). Have a look before our 12:30 meeting if you can. Otherwise, hope to see a critical mass of you then. Thank you! – Genesee

-----Original Appointment-----

From: Cawaling, Cindy **On Behalf Of** Adkins, Genesee

Sent: Monday, April 15, 2019 5:32 PM

To: Adkins, Genesee; Rula, Kelly; Castleman, Kris; Lo, Kevin; Krawczyk, Tracy; Simpson, Kristen; Hobson, Mafara; Melanson, Karen; Lorenzana, Candida; VanValkenburgh, Cristina; Schellenberg, Dawn; Williams, Lorelei

Cc: Zimbabwe, Sam

Subject: Congestion Pricing

When: Tuesday, April 16, 2019 1:30 PM-1:55 PM (UTC-08:00) Pacific Time (US & Canada).

Where: Sam's Office / 38th Floor SMT

Genesee has requested this follow up meeting.

To: Mayor Jenny A. Durkan
Date: April 19, 2019
Subject: Affordable Housing Revenue
From: Kate Garman, Kylie Rolf, Edie Gilliss, Shefali Ranganathan

Purpose: We are briefing you next week to present our updated proposal on affordable housing revenue. The materials attached to this briefing review the proposal, relevant spend plans, implementation requirements, and a communications/outreach strategy. We seek your guidance and approval on proposed next steps.

Summary: We are proposing to place a tax on transportation network companies on a per ride basis for the purpose of:

- Curbing the congestion impact of TNCs
- Increasing TOD affordable housing supply
- Improving transit and mobility options
- Protecting drivers by requiring fair pay and fair treatment

Background: Subsequent to our last briefing in the fall, we have set up the following tax structure:

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Recommendations/Options/Next Steps: A briefing is scheduled next week to review this memo and discuss next steps.

Appendix

[redacted]

Appendix 1: TOD Affordable Housing Spend Plan
Office of Housing
From: [Authors] – Please limit to no more than 2 pages, 1 preferred.

[redacted]

Policy Goal/Purpose:

Summary: *include here target community/audience, other details as necessary (what qualifies under TOD)*

Proposal:

Impact: *if this redundant and you've included this in proposal, delete this section. Units provided, mobility options increased per year, etc.*

Appendix 2: Transportation Spend Plan
Seattle Department of Transportation
From: Sam Zimbabwe

[redacted]

<u>Policy Goal/Purpose:</u>

[redacted]

<u>Summary:</u>

[redacted]

<u>Proposal:</u>

1. **Strengthening Our Multimodal Network**

   [redacted]

   [redacted]

2. **Mitigating the Impacts of TNCs**

   [redacted]

Appendix 3: [redacted].

[redacted]

Policy Goal/Purpose:

Summary: [redacted]

Proposal:

Impact: *if this redundant and you've included this in proposal, delete this section. OLS- I think highlighting what other cities are doing, or rather that we are the first to do something.*

Appendix 4: Implementation Requirements – Schedule and Budget
Finance and Administrative Services
From: [Authors] – Please limit to no more than 2 pages, 1 preffered

Policy Goal/Purpose:

Summary: *of time and cost to implement*

Proposal:

Section on cost

Section on implementation timeline and requirements

Appendix 5: Communications, Outreach, and Council Engagement Proposal/Next Steps
Office of the Mayor
From: [Authors] – Please limit to no more than 2 pages.

Policy Goal/Purpose:

Summary: *of time and cost to implement*

Proposal:

Section on cost

Section on implementation timeline and requirements

From:	Adkins, Genesee
To:	Rula, Kelly; Castleman, Kris; Lo, Kevin; Krawczyk, Tracy; Simpson, Kristen; Hobson, Mafara; Melanson, Karen; Lorenzana, Candida; VanValkenburgh, Cristina; Schellenberg, Dawn; Williams, Lorelei
Cc:	Zimbabwe, Sam
Subject:	RE: Congestion Pricing
Date:	Tuesday, April 16, 2019 2:39:42 PM
Attachments:	AHR Mayoral Memo Template Draft 4-16-19_SDOT rev.docx

Here is a revised page 4 with your input from our 1:30 conversation. Thanks, all – Genesee

From: Adkins, Genesee
Sent: Tuesday, April 16, 2019 12:04 PM
To: Rula, Kelly <Kelly.Rula@seattle.gov>; Castleman, Kris <Kris.Castleman@seattle.gov>; Lo, Kevin <Kevin.Lo@seattle.gov>; Krawczyk, Tracy <Tracy.Krawczyk@seattle.gov>; Simpson, Kristen <Kristen.Simpson@seattle.gov>; Hobson, Mafara <Mafara.Hobson@seattle.gov>; Melanson, Karen <Karen.Melanson@seattle.gov>; Lorenzana, Candida <Candida.Lorenzana@seattle.gov>; VanValkenburgh, Cristina <Cristina.VanValkenburgh@seattle.gov>; Schellenberg, Dawn <Dawn.Schellenberg@seattle.gov>; Williams, Lorelei <Lorelei.Williams@seattle.gov>
Cc: Zimbabwe, Sam <Sam.Zimbabwe@seattle.gov>
Subject: Re: Congestion Pricing
Apologies for any confusion: We have time today at **1:30** (not 12:30) in rm **4155**. Thanks!

On Apr 16, 2019, at 11:13 AM, Adkins, Genesee <Genesee.Adkins@seattle.gov> wrote:

All: Here is my shot at our 1-page summary for the briefing book (see page 4). Have a look before our 12:30 meeting if you can. Otherwise, hope to see a critical mass of you then. Thank you! – Genesee
-----Original Appointment-----
From: Cawaling, Cindy **On Behalf Of** Adkins, Genesee
Sent: Monday, April 15, 2019 5:32 PM
To: Adkins, Genesee; Rula, Kelly; Castleman, Kris; Lo, Kevin; Krawczyk, Tracy; Simpson, Kristen; Hobson, Mafara; Melanson, Karen; Lorenzana, Candida; VanValkenburgh, Cristina; Schellenberg, Dawn; Williams, Lorelei
Cc: Zimbabwe, Sam
Subject: Congestion Pricing
When: Tuesday, April 16, 2019 1:30 PM-1:55 PM (UTC-08:00) Pacific Time (US & Canada).
Where: Sam's Office / 38th Floor SMT
Genesee has requested this follow up meeting.
<AHR Mayoral Memo Template Draft 4-16-19_SDOT.docx>

To: Mayor Jenny A. Durkan
Date: April 19, 2019
Subject: Affordable Housing Revenue
From: Kate Garman, Kylie Rolf, Edie Gilliss, Shefali Ranganathan

---

Purpose: We are briefing you next week to present our updated proposal on affordable housing revenue. The materials attached to this briefing review the proposal, relevant spend plans, implementation requirements, and a communications/outreach strategy. We seek your guidance and approval on proposed next steps.

Summary: We are proposing to place a tax on transportation network companies on a per ride basis for the purpose of:

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- Increasing TOD affordable housing supply
- Improving transit and mobility options
- Protecting drivers by requiring fair pay and fair treatment

Background: Subsequent to our last briefing in the fall, we have set up the following tax structure:

[redacted]

[redacted].

[redacted]

[redacted]

[redacted]

Recommendations/Options/Next Steps: A briefing is scheduled next week to review this memo and discuss next steps.

Appendix

[redacted]

Appendix 1: TOD Affordable Housing Spend Plan
Office of Housing
From: [Authors] – Please limit to no more than 2 pages, 1 preferred.

[redacted]

Policy Goal/Purpose:

Summary: *include here target community/audience, other details as necessary (what qualifies under TOD)*

Proposal:

Impact: *if this redundant and you've included this in proposal, delete this section. Units provided, mobility options increased per year, etc.*

Appendix 2: Transportation Spend Plan
Seattle Department of Transportation
From: Sam Zimbabwe

[redacted]

<u>Policy Goal/Purpose:</u>

[redacted]

<u>Summary:</u>

[redacted]

<u>Proposal:</u>

1. **Strengthening Our Multimodal Network**

[redacted]

2. **Mitigating the Impacts of TNCs**

[redacted]

Appendix 3: [redacted]

[redacted]

<u>Policy Goal/Purpose:</u>

Summary: [redacted]

<u>Proposal:</u>

<u>Impact:</u> *if this redundant and you've included this in proposal, delete this section. OLS- I think highlighting what other cities are doing, or rather that we are the first to do something.*

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Finance and Administrative Services
From: [Authors] – Please limit to no more than 2 pages, 1 preffered

<u>Policy Goal/Purpose:</u>

<u>Summary:</u> *of time and cost to implement*

<u>Proposal:</u>

Section on cost

Section on implementation timeline and requirements

Appendix 5: Communications, Outreach, and Council Engagement Proposal/Next Steps
Office of the Mayor
From: [Authors] – Please limit to no more than 2 pages.

Policy Goal/Purpose:

Summary: *of time and cost to implement*

Proposal:

Section on cost

Section on implementation timeline and requirements

From: Adkins, Genesee
To: Helmbrecht, Elliot; Zimbabwe, Sam
Subject: RE: updated numbers
Date: Thursday, April 18, 2019 7:01:53 PM
Attachments: theory smh 2.xlsx

Here's my edit:
I made a couple changes:

- [redacted]
- [redacted]
  - [redacted]
  - [redacted]
- [redacted]

Thoughts welcome. Thanks – Genesee

From: Helmbrecht, Elliot <Elliot.Helmbrecht2@seattle.gov>
Sent: Thursday, April 18, 2019 6:27 PM
To: Zimbabwe, Sam <Sam.Zimbabwe@seattle.gov>
Cc: Adkins, Genesee <Genesee.Adkins@seattle.gov>
Subject: Re: updated numbers

Yes. [redacted]

Get Outlook for iOS

From: Zimbabwe, Sam
Sent: Thursday, April 18, 2019 6:00:31 PM
To: Helmbrecht, Elliot
Cc: Adkins, Genesee
Subject: Re: updated numbers

I think this looks good (but a bit hard to tell on my phone). [redacted], right?

____

Sent while away from my desk
Cell/text: 206-300-4176

On Apr 18, 2019, at 5:54 PM, Helmbrecht, Elliot <Elliot.Helmbrecht2@seattle.gov> wrote:

> Attached are the numbers I'll use for the updated memo. Let me know if you see any errors/concerns.
> <image002.png>Elliot Helmbrecht (he, him, his)

Office of Mayor Jenny A. Durkan | City of Seattle
O: 206-233-2011 M: 206-379-1286 | elliot.helmbrecht2@seattle.gov
Facebook | Twitter | Subscribe to Mayor Durkan's E-Newsletter

<theory smh.xlsx>

[redacted]

[redacted]

From: Helmbrecht, Elliot
To: Zimbabwe, Sam; Adkins, Genesee
Subject: updated numbers
Date: Thursday, April 18, 2019 5:54:41 PM
Attachments: theory smh.xlsx
image001.png
image002.png

Attached are the numbers I'll use for the updated memo. Let me know if you see any errors/concerns.

Elliot Helmbrecht (he, him, his)
Office of Mayor Jenny A. Durkan | City of Seattle
O: 206-233-2011 M: 206-379-1286 | elliot.helmbrecht2@seattle.gov
Facebook | Twitter | Subscribe to Mayor Durkan's E-Newsletter

[redacted]

[redacted]

From: Garman, Kate
To: Adkins, Genesee
Cc: Helmbrecht, Elliot; Zimbabwe, Sam
Subject: Updated Presentation
Date: Wednesday, March 13, 2019 12:17:32 PM
Attachments: TOD.Transport.Worker Protections. 3.12.2019.pptx

---

Genesee,

This looks great. I've put your slides in the presentation- and wanted you to see what we've added. My understanding is there a meeting with Ben tomorrow with Kylie and JFC. Hopefully that will be a good time to talk about principals and any remaining questions SDOT may have.

Truly appreciate your flexibility and providing the spend plan in the world of a moving target on our side!

NOT TO MENTION THE SACRAFICE OF PI DAY.

!!!

See you all tomorrow,

Kate

TOD/Transportation/Worker Protections Revenue Planning

E-Team Briefing

March 14, 2019

Agenda

- Goals for Policy
- Tax and fees in other cities
- Recap of anticipated revenue and allocation to various spending areas
- Transportation Spend Plan
- Work Protections & Companion Resolution Update
- Timeline to move forward

Proposal: Goals

[redacted]

Proposal: Specifics

[redacted]

[redacted]

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City	Fee or Tax	Year Most Recent Action Passed	Estimated Revenue	What the revenue is going toward
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Washington DC	6% tax on revenue	July 2018	$23M per year	Revenue will go toward funding the District Metro. Note: the 6% rate now puts taxis and TNC's at the same tax and fee level

Revenue Projections

[redacted]

Housing Spend Plan (Leslie)

[redacted]

Transportation: Part 1 – Pieces in Motion

[redacted]

Transportation: Part 2 – Needs & Spend Plan

- SDOT has pre-existing budget pressures as well as emerging asset and program needs.

- Spend levels could address both without creating unreasonable expectations.

[redacted]

Worker Protections (Adrienne)

- Approach: [redacted]
- Policy goals

  [redacted]
- Creation of new programming or boards:

  [redacted]

Timeline moving forward (Kylie)

Kylie to insert

Outreach Plan (Kyla/DON)

Communications Plan (Mark/Kamaria)

Council Engagement Plan (Anthony)

Internal Schedule

- 3/14 Transportation Spend Plan + Worker Protections
- 3/21 FAS Implementation + TOD Spend Plan
- 3/28 Communications, Outreach and Council Strategy
- *[Week of April 1: Mayoral Briefing]*
- 4/4 Confirm spend plans
- 4/11 Driver Protection Companion Ordinance
- 4/18 Department Director Meeting + Strategy of Implementation
- 4/25 SDOT Literature Review Complete